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Prehistoric Man

A General Outline of Prehistory

By

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FOREWORD

THE HAND AND THE TOOL

THE first volume of l'Évolution de l'Humanité both links man with nature and shows in what he has broken away from it. We see the human form appear in the course of the ascent of living forms. This form, doubtless, results from an infinite number of different circumstances, and of these Perrier has indicated the principle among those that come within the bounds of our knowledge; but this form above all results from innate tendency—from the inner growth that constitutes life itself, and which, in the human brain, culminates in thought.

"It is our desire to know, to see further and from a greater height, that has made us rise to the completely erect attitude of which we are so proud," says Perrier.¹ "It is this which has freed the hands from tasks other than prehension and the examination of objects and the construction and manipulation of defensive weapons. Thanks to these, the jaws entirely ceased to bite and tear, as they had already ceased to seize, and limited themselves to the mastication of food. On account of this less arduous work, they became shorter and lighter."² The reduction of the muscles controlling the biting movement of the lower jaw had the effect, in turn, of giving more room for the brain and thus permitting a considerable development. By the joint action of cause and effect and of the persistence of the initial tendency, the human face was gradually "prepared for language and for smiling."

The hand and language: in these two is comprised humanity. We feel that two things should be given the premier place in this work — two things that mark the close of zoological and the beginning of human history; one, if we may so put it, is the invention of the hand, and the other is the invention of language. In these two lies the decisive progress in practical logic and in mental logic that characterizes mankind.

¹ Part III, Chap. iv, p. 324.

² Part III, Chap. iv, p. 320.

Though physical environment and the factor of race have both played their part in human evolution—and that a considerable one which will be treated in detail—the logical element in either case has been their basis. Though social environment has played its part—an important one, which will be emphasized—far from having created logic, it is in itself a manifestation thereof: society is an intensive manner of living, tentatively begun by the animals, perfected by mankind.

Logic, it must be remembered, is for us something wider than finality. It is the appropriation—which may yet be purely fortuitous, or just experimental—of means to necessities arising out of the inner tendency.¹ Logic in act or deed is manifested in that life retains what is useful to it and thus adapts itself to environment. As Henri Bergson has shown (since there is one part of his Evolution créatrice which is unassailable and which sums up, profoundly and attractively, the data of objective science), organized matter has “the mysterious power of building up very complicated machines” and, by means of this mechanism, of usefully setting free the energy it has accumulated.² We can define it either as a mechanism formed within, or as an “organization which invents itself.” History, in its widest sense, is logic that is lived,—before it has either been exteriorized logic (technique), collective logic (society), or reflective logic (reason).

History in its entirety is essentially logic. This, then is our fundamental hypothesis: that the work, taken as a whole, should be verified by the independent labour of eminent collaborators. And this hypothesis governs our plan.

* * *

The subject of the present volume, in essence is the hand and the hand's extensions. We cannot insist too strongly that in the evolution of life the “decisive moment” arrived when a living being—who became man—adopted the erect attitude, thus freeing his hands,³ and when the industrious activity was inaugurated which this freedom made possible. In the use of the hand as an instrument, we have the manifestation of an important psychical progress and the promise of further important progress.

¹ See Vol. I, General Introduction, p. xi, and my *Synthèse en Histoire* pp. 141-226.

² [E.T.] *Creative Evolution*, p. 76.

³ See E. de Majewski, *La Science de la Civilization* (a deep and original book), p. 213.

The primitive evolution of mental processes can only be gathered in approximate fashion from the relation between the behaviour of beings—as modern zoological psychology¹ calls it—and the development of the nervous system, or rather of its crowning cerebral effort. Among those “moving oceans of the forms of life,” we see the brain, which assures internal harmony and presides over external relations, growing ever larger and more perfect in proportion as the organism grows more complex, and not only adjusting itself better to the external world, but frequently exercising influence on it.

Already among the insects, in the course of the Secondary Period, the brain had acquired a certain volume which corresponded to this almost fixed “savoir-faire” which we call (by an equivocal term) instinct. There is here a lower psychic system, the result (we have the right to infer) of the “tendency” and the associative memory.²

In the course of the Tertiary Period, the psyche developed remarkably among the vertebrates. With the mammals the various functions became centralized and controlled by the growth of the cerebral hemispheres. This growth, in a skull that was too narrow, involved, especially among the primates, folds and convolutions. The brain was modified to a greater extent, and more rapidly, than the rest of the body. “In the progression of the cerebral hemispheres through the geological epochs and the zoological stages, it was the frontal lobe, the seat of the most complicated associations and the closest mental combinations, which increased in size”;³ it became the intellectual centre.⁴ The Primate, the relative weight of whose brain is enormous,⁵ has a wonderful faculty for adaptation; and this is especially manifest in the aptitude for prehension of its anterior limbs, with an opposable thumb and flat nails. In the Anthropoid the anterior limbs, freed from the locomotor function, are kept entirely for prehension, and thus we arrive at the hand.

It is probable that, in the course of the Tertiary Period, the

¹ See H. Piéron, “La psychologie zoologique, science du comportement animal,” in the *Journal de Psychologie*, February and March 1920.

² See E. L. Bouvier, *La Vie psychique des Insectes*.

³ E. Houzé, “Les étapes du lobe frontal,” in the *Bull. de l'Institut de sociologie Solvay*, February 1910, p. 93.

⁴ On this question, see Gley, *Physiologie*, Vol. II, pp. 1081 ff.

⁵ Taking the weight of the brain as equalling 1, the weight of the body is 5,688 for Fishes, 1,321 for Reptiles, 212 for Birds, 100-60 for Anthropoids, 36-22 for Man. Houzé, p. 94; cf. Gley, p. 1,085.

progressive differentiation of the seasons and the absence of fruit for many months of the year, caused certain Primates, whose anterior limbs were shorter than their posterior limbs, to abandon definitely the arboreal life, to stand erect, to walk, and to differentiate the four extremities of their limbs into feet and hands.

The "desire to know, to see further and from a greater height," of which Perrier talks, is better satisfied by the erect posture, and certainly encouraged its adoption. But the desire to know, in its origin, is altogether practical; it is grafted on the immediate vital interest. Just as it was self-interest that provoked the adoption of the erect attitude and the employment of the hand qua hand, so it was self-interest that kindled the dawn of consciousness in the brain. The psychic synthesis produced this dawn, and the light increased the power of the synthesis. Tendency can satisfy itself after a fashion, in the most obscure consciousness; but activity as it comes out into the light, becomes ever more sure of itself.¹

It has been aptly observed that animals are specialists, that their structure, adapted to determined conditions of life, has procured for them a certain superiority within narrow limits, and, at the same time, has stabilized them almost definitely. Their mental system or "psychism" has only "fringes of intelligence." Man escapes morphological specialization. Homo nudus et inermis. His frontal lobe orders everything, and his hand is the active exteriorization of his brain. Being without any such specialized physical means of defence or offence as tusks, horns, claws, carapace or scales, he yet has his hand—an instrument strengthened by its locomotor use, made supple and delicate by its prehensile activity, and early appropriate to the most diverse uses in the most varied circumstances.

The hand, as a result of experiment—both tactile and muscular—acquires information that is ever more and more precise, associated, as it is, with visual sensations which it completes, and thus contributes effectively to the knowledge of the external world. By mimicry and attempts at language it brings men ever closer together, and indirectly encourages relations between them by making co-operation between them possible—thanks to a new sort of specialization that is no longer specific and structural, but individual and functional. Thus society develops, like the living

¹ See H. Wallon, "Le problème biologique de la conscience," in the *Revue Philosophique*, March-April 1921, p. 180.

being, by the stronger unity of the whole in the greater diversity of its component parts.

How far back does it go, this hand which so strangely increases the powers of a privileged species? Even if it is impossible to determine exactly, there is no doubt that it was very far back—thousands of centuries—in the Tertiary. We are justified in saying, though we cannot prove it, that several human species, among which was the species destined to become *Homo Sapiens*, existed in the Pliocene and even in the Miocene—if not earlier. The earth has, up to the present, been but imperfectly examined, and has yielded little for Palæontology. "In the Pliocene and Miocene formations strange and thrilling discoveries lie in reserve. . . . A day will surely come when we shall discover a small anthropoid, of almost erect attitude, and with a brain-pan relatively very large in comparison with the total volume of the body, but very inferior, in absolute value, to all known members of the Human Family."¹ The ancient history of the historians "is in reality only an ultra-modern history for the prehistorian, and still more so for the palæontologist."² In the most ancient history of all, the history of the Human Family, each cubic centimetre and each fold of the brain represents centuries of experience, to which the increasing ingenuity of the hand corresponds.³

* * *

From the time when the earliest scanty human remains appear—at the beginning of the Quaternary—that is, in the Lower and Middle Pleistocene—Man is already provided with artefacts:⁴ this was the Lower Palæolithic, the period of the earliest implements—which dates back, consequently, hundreds of centuries. In the Upper Pleistocene, after the last glacial phase, we find fossil remains of *Homo sapiens*⁵ and the already advanced civilization of the Upper Palæolithic. With the commencement of the last phase, Holocene, we are dealing with *Homo sapiens*⁶

¹ M. Boule, *Les Hommes fossiles*, p. 175.

² *Ibid.*, p. 459.

³ See *Ibid.*, pp. 231 ff. for all that the study of the endocranial surface can teach.

⁴ Chellean, Acheulean, Mousterian: *Homo heidelbergensis*, *Homo neanderthalensis*.

⁵ Grimaldi, Cro-Magnon, and Chancelade races,

⁶ See Boule, *op. cit.*—a far-reaching and careful synthesis (resumé by J. de Morgan in the *Revue de Synthèse historique*, Vol. XXXI, "Les origines de l'homme"), completed by M. Pittard's volume on Race in this series.

as we know him. His industrial activity and his inventive genius are manifested so completely in the Neolithic—which dates from some 14,000 years in the Orient, and 9000 years in our part of the world—and then in the age of metals whose starting point varies likewise according to locality—that it is evident that the essentials of technique had already long been established. “All manner of hand implements, the earliest elementary machines, industries of primary necessity such as spinning, weaving, ceramics and metallurgy; the wheel and navigation, the employment of domesticated animals, the practice of agriculture, buildings in stone—all these acquisitions pre-date history.”¹

But it was the first inventions that were decisive, when the hand, more and more adroit, came to be used in the making of tools, and when these inventions for defence and attack, for all sorts of useful ends, and for the amelioration of the conditions of existence, increased the possibilities of the hand's own employment. Completed as it were, by the implement, this organ of action on things itself becomes a universal instrument. More precisely, it is the brain which becomes a universal instrument—the brain which develops marvellously as a result of the very use of the tools that the hand permits it to realize. And while the species itself increases and becomes universal, the faculties of functional specialization in the individual are also increased.

How did the first implements come to be made? An obviously insoluble problem if we wish a precise answer.

Hypotheses have been advanced. The theory of spontaneous extension—according to which men extended the arm in the stick, the finger in the hook, the fist in the club—is not very satisfactory. It is evident enough that implements elaborated and imitated parts of the human body in the beginning: but human invention is manifest more especially in the utilization of the properties of different materials, and in the fashioning of such materials.²

Besides, there were primitive discoveries, like that of fire, which cannot be explained by this “extension” theory. Man knew how to make fire from the beginning of the Palaeolithic, and this is “the pre-eminently human act, that which is at the foundation of all future progress, and potentially contains all civilization—the discovery of which constitutes the most char-

¹ L. Weber, “Y a-t-il un rythme dans le progrès intellectuel?” (*Bull. de la Soc. franç. de philosophie*, February-March 1914, p. 81).

² See L. Weber, *Le rythme du progrès*, p. 259.

acteristic act of genius which Humanity can boast."¹ A weapon, a light, a modifying agent of the most varied materials;² fire marks a date in prehistory, more important than all the revolutions of history. Prometheus is the great revealer.

For this invention in two stages had its Prometheus, or more than one of them. First, spontaneous fire had to be preserved, and then fire had to be made artificially. The part played by intelligence and by the individual must be insisted on in any consideration of the beginnings of human industry. Consequent on manual skill (itself consequent on the vital and creative activity of the organs of the body), practical intelligence activated by self-interest must be sharply distinguished from theoretical intelligence, and from disinterested curiosity. That form of intelligence which tends to the "conquest of realities," and direct knowledge for immediate power, is anterior to speculative intelligence; or at least, the utilitarian function of the intelligence was for a long time preponderant.

This faculty, which Voltaire called the mechanical instinct, whose importance the eighteenth century was the first to emphasize, is specific rather than social, and appears in all individuals, though in varying degree in different individuals. Prometheus is the "Foreseer," the individual gifted with attention and capable of dissociating the part from the whole and employing it in a practical combination³; it was Prometheus who utilized a brand from a fire kindled by lightning, or the property, either of two branches rubbed against each other by the wind, or of two stones struck against one another by chance, of kindling a spark. It was he too, who, noticing the recoil of a bent branch, by analogy with the arm which throws the stone, arrived at imagining a bow; it was a Prometheus who, aiding the task of tooth or nail with the sharp edge of a flint-chip, invented the first implement: it was a Prometheus who saw what others did not see (as Galilio saw the lamp which swung in the cathedral of Pisa) and who had the wit to take advantage of his discoveries.

The imitation of such initial attempts, and the joining thereto

¹ Boule, *op. cit.*, p. 460. He himself cites Rémy de Gourmont, *Promenades philosophiques*, 2nd Series, p. 11. See also P. Lacombe, *L'Histoire considérée comme science*, pp. 180-185.

² The cooking of food has had its effect on the brain: by reducing the masticating muscles, it has facilitated frontal activity. See Houzé, *art. quoted*, p. 95.

³ See Paulhan, *Psychologie de l'invention*; Ribot, *Essai sur l'imagination créatrice*.

of successive steps in progress, are of a different order from all social action. Along with certain thinkers, we believe that technical invention, at its live point, so to speak, bears the hall-mark of individual effort—like all invention. It is born of direct experience from the contact of the brain with the external universe.¹ Without doubt social life favours technique in a thousand ways: it is the instigator and propagator of inventions; but it also shackles them very often, by tradition, routine and the development of illusory practices linked up with abortive speculation²—whereas in the most primitive technique an element of speculation is implicit.

Already the living organism is in a measure an intelligence in action: "All our organs imply some sort of knowledge of the objective and material exterior world. . . . The lungs of a quadruped and the gills of a fish are in their degree an appreciation of the environment in which the animal has to breathe; feet, fins, and wings postulate realization of the environment in which the various beings must move. . . . All organization, all system, implies something analogous to understanding which permits the existence and functioning of the system, as it implies something analogous to desire and will, a tendency which is an essential part of it, just as it is an essential part of human activity".³

If concrete mechanics and physics accompany the exercise of muscular energies, the extension of these energies by technique implies a sufficiently objective representation of the material world, and, at the very least, the clear feeling that there is a certain regularity in things. Before it was conceived as such, the law of causality was more and more felt by the unfolding of human activity in a world ruled by this law, a world of which man is an integral part.

¹ See L. Weber, *Le rythme du progrès*, p. 263. "The inventors (of implements), although for the most part unknown, misunderstood or forgotten, have not worked, in their inventions, in dependence on the group, nor according to its suggestions or beliefs, but according to their own intellectual spontaneity. The material invention is in itself the purest manifestation (and also the simplest and oldest) of the individual intelligence, the *proprium quid* of the specific human intelligence." Even if it responds to a social need and comprises co-operation, the material invention is "in itself an individual penetration into the world of physical realities, a direct struggle of intelligence with matter carried on by a single being and precisely because of what is in him which is irreducible to the collective spirit." Cf. *Bull. de la Soc. française de philosophie*, February-March, 1914. "Y a-t-il un rythme dans le progrès intellectuel?" pp. 70 (Weber), 90 (Parodi), 130 (Belot).

² See Weber, *op. cit.*, pp. 141 ff.; Veblen, *The Instinct of Workmanship* (Cf. Halbwachs, *Revue Philosophique*, March-April 1921).

³ Paulhan, "Sur le psychisme inconscient," in the *Journal de Psychologie*, February 1921, p. 160.

*Technique preceded technology, and, a fortiori, science ; but it prepared the way for both. "Technique is the mother of rational logic."*¹

* * *

Indeed, Man, in his beginning, is Homo faber rather than Homo sapiens. And he remains Homo faber. We shall have to show later that the part played by technique, decisive at the beginning, is throughout human evolution immense :² Man is "a worker and an engineer," "a tireless maker of tools, instruments, and machines."³

*Paul Lacombe, that vigorous and original theorist in history, who gave a preponderant place to economics,⁴ was to have contributed a preface to J. Toutain's volume on Ancient Economic Organization, in which he would have related the technique of prehistory to the Economics of the Greeks and Romans. What he has written on these matters—for example in his *Histoire considérée comme science* ; and in certain notes in his *Journal*, where this preoccupation of his is manifest—makes us keenly regret the loss of a collaborator so well fitted for the task. Not only did he analyse, with a penetrating ingenuity, this evolution from superficial to fundamental properties of things, and in which, little by little, art and science are disengaged from technique : but he also emphasized the fact that in the history of technique—a continuous chain of general history—the masses, the plebs, played their part, and an important part : "The history of technique would not be universal history but, beyond a doubt, it would be the most universal of histories, since man in the mass, at all times has been a workman."⁵*

It is under his inspiration that we shall return later to the development of inventions ; that we shall distinguish those which increase the power of our hands, those which take their place, and those which allow us not only to use things, but to capture and turn to our profit energies of all sorts, such as those that increase the

¹ Ribot, *Logique des sentiments*, p. 27. Cf. Espinas, *Les origines de la technologie*.

² This is the proportion of truth that historic or economic materialism contains.

³ P. Lacombe, *Rev. de Synth. hist.* : Vol. XXIV, p. 369. For P. Lacombe as for Weber, in opposition to Auguste Comte, the first phase of humanity is *technical*, and not *theological*.

⁴ On Lacombe, see Berr, *L'Histoire traditionnelle et la Synthèse historique*, pp. 57-144.

⁵ *Journal*, October 22, 1914.

range of our senses and give us, so to speak, "artificial senses", and those that increase our facilities for moving about in space, and communicating with our kind; we shall dwell on this infinite development of tool and equipment, born from the hand, whose repercussions are themselves infinite and very often completely unforeseeable—and all of which have made of man a god. It has been said that machines are exterior organs rendering the fleshly muscles useless, and that by them we tend to the state of "pure spirit."

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What we shall find in this book is prehistoric man, generically not physically. I mean that it will not be a question here of prehistoric anthropology. All that concerns the physical characteristics of our far distant ancestors—the completion of the brief indications given by Edmond Perrier at the end of The Earth before History—will be related by M. Pittard in the volume in this series in which he studies proto-historic races and the factor of race in general. To secure a just distribution of material and a full use of expert knowledge, it seemed best to divide the subject thus.

M. Cartailhac had originally honoured us by a promise to lend to our work the great authority of his name. Later, he mistrusted his powers, surely without reason. He feared to delay us; and M. de Morgan, at his desire, has been good enough to replace him. As M. Cartailhac had intended to do, the Former Director of Antiquities in Egypt and General Delegate to Persia has treated the subject of human activity in the light of its first extant traces, and indicated the primitive stages of human progress.

De Morgan is one of the most eminent representatives of this distinctly French science of prehistory. No one comprehends it with a wider range of interests and a broader knowledge. All works dealing with prehistory take our part of the world as a basis and neglect the Orient. This entails not only an insufficiency of data but also, perhaps, an error in the point of view. It was the Orient, it seems, which, in the beginning, played the predominant part. The truth is to be found, in all these cases, by placing the evolution of those areas side by side with the evolution of Western Europe, and by putting together what we know of both. This De Morgan can do, having spent six years in Egypt,

three years in the Caucasus and Armenia, and sixteen years in Persia; his synthetic point of view is altogether happy, new, and highly appropriate to our design.

De Morgan, while dealing with primitive humanity as a whole, and treating of diverse regions and civilizations as particular cases of general prehistory, is also personally familiar with the various sciences which have to be drawn upon for a thorough interpretation of the facts. Geology, palæozoology and palæobotany, and climatology are necessary to the comprehension of human evolution: the complexity of the causes necessitates diversity of knowledge.

Finally, de Morgan does not only provide a rich and precise text, but ample illustration. Primitive man, in his humble life, can only be reached through the remains of his industry: the prehistorian must investigate objects of all kinds; and he must, naturally, make them known to the reader. De Morgan has justly estimated that it would lighten the work, and obviate long descriptions and comparisons if the objects were themselves presented; and he found in this the further advantage of being able to give more room to general ideas. The 190 plates of this volume, the 1300 figures—a certain number of them illustrating his own discoveries—have been for the most part drawn by him; he has sought rest, in the course of his work, only in change of occupation. By their selection, juxtaposition and appropriate insertion to the body of the text, these figures add greatly to the value of the book; de Morgan has so conceived it that it appeals at once to the eye and to the mind.

•

This is true prehistory—with its palæolithic and neolithic epochs—and industry occupies the principal place. But, in this great fresco of our most distant past, de Morgan has also included the age of metals, and he gives us a general impression, in broad strokes, of primitive life under its various aspects. He has thus set out in general outline the characteristics of proto-historic civilizations to be studied in detail in special volumes; his volume is the key to them.¹

One of his great merits, moreover—and one which we think it worth while to stress, because it falls in so well with the general character of this history—is that of not over-emphasizing the extent

¹ We shall have occasion to deal ourselves with psychic origins, and the social rôle of art and religion.

of our knowledge, of not hiding the problems which remain, but even of dwelling on them. "What we know to-day is very little in comparison with what remains to be learned"; such are his final words. But throughout the book he puts the public on its guard against "hypotheses which have nothing scientific about them," and he multiplies prudent reservations. On the original homes of the human species, on the synchronism of the stages passed through by different races and groups, on their migratory movements and their inter-relations, on questions of independence or communications in relation to the development of industries, he exhibits that modesty of knowledge which is characteristic of all great authorities.

There is no lack of collectors—"amateurs of worked flints"—but there are only too few historians devoting themselves to prehistory. Nothing is more useful than to give workers in this field—beginners above all—a comprehensive idea of the evolution of humanity as a whole, and to point out the lacune in our knowledge.

As regards prehistory, much of the earth's surface remains to be explored, and research is not yet organized. De Morgan will have deserved well of science in showing precisely what remains to be done in this large and singularly attractive field, which is of capital importance for any historical synthesis.¹

HENRI BERR.

¹ We believe that there will also be something to do, in history, as regards standardizing the nomenclature—de Morgan deliberately uses the word *prehistory* in a broad sense:—all that concerns primitive man (he sometimes says: the *barbarian*), of whatever age and wherever found. For him, then, ethnography coincides in part with prehistory; he talks of "modern prehistory." He also gives a very broad sense to the word "philosophy."

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PREFACE

No book can ever be definitive which deals with questions based on discovery and observation. Such works can only be up-to-date on the day of publication: a month later the author will already have had occasion to modify certain passages of his text. This is bound to be the case with *Prehistoric Man*. I should be neglecting my duty to the reader if I failed to acquaint him with discoveries and new ideas which have been put forward during the few short months since I passed the first (French) edition of this book for press.

In the interval I have sought the opinion of scientific colleagues, and they express themselves as satisfied with my résumé; but that is not precisely what I meant. In a book which endeavours to contain the story of the age-long upward struggle of Man within 300 pages there cannot fail to be gaps.

Nor are these the only possible sources of error. During the last two or three years a number of works in various languages have appeared, and it has happened that when these books have come to my knowledge I have sometimes been driven to modify my views. Further, the far-reaching studies which I have been obliged to undertake in connection with my forthcoming work, *la Préhistoire orientale*, have led to fruitful discussions with specialists as to the interpretation to be put on certain facts, and I have endeavoured to give the reader the benefit of these in this edition.

J. DE MORGAN.

25th January 1923.

PREHISTORIC MAN

PRELIMINARY REVIEW OF THE FIELD

THE study of man's prehistory, or of that phase of his evolution for which there is no written document to guide research, is still in its infancy, although it has been actually in existence for nearly a century. On the one hand, our investigations, still unfortunately very summary, are based on data from only a small number of countries ; on the other, we possess no comparative term permitting us to measure in time as well as in space, the extent of these first efforts of man to better the conditions of his existence. Moreover, the breadth of the subject is such that this branch of study makes a demand on the greater part of scientific knowledge. Geology, zoology, botany, climatology, anthropology, and ethnography are the bases of prehistory, which, like all science based on observation, runs alongside that wall of shadows behind which the origins of living creatures and things lie hidden.

When we get out along the various scientific roads leading back to our origins, we soon come face to face with the unknown. In proportion as we advance, obscurity increases, until the gloom of the past and of the future becomes so complete that the insufficiency of our means of investigation renders it impenetrable. Our processes of observation have proved inadequate ; time has destroyed most of the evidence within reach of our intellect, and that which has survived the defacing hand of time too often escapes our perspicacity. The further we go back the more difficult it is to distinguish such traces as the passing years have left intact. In those very parts where our footsteps press the thickest, and where we think we know every inch of the ground, our observations are still superficial. For centuries we have failed to recognize the remains of those old civilizations of the stone age. To-morrow, perhaps, evidences still more ancient will appear : the darkness will recede a little ; but we shall never get back

to the beginning of things, never completely disperse the obscurity that enshrouds them.

Moreover, our present-day researches into the great antiquity of Man on the earth have covered, as yet, but a limited geographical area: Western Europe, Northern Africa, certain points in Western Asia and in North America, alone, have yielded us some of their secrets—incomplete confidences of limited extent, from which it would be highly dangerous to draw general conclusions. We are barely entitled to suggest one or two hypotheses. It must never be forgotten that a multitude of indications still certainly escape us, that the stone industries on which we base our theories constitute but an insignificant part of the witness to human life, and that other evidence either has not yet been made manifest, or else has been lost for ever.

The mind inevitably inclines to the generalization of phenomena of whose existence it has proof, and to the neglect of the thousand and one unknown questions it has penetrated only in part; and these very human tendencies have been the origin of theories relative to the prehistoric life of man that were absolute even while they were irrational. Can we, in fact, admit that in comparison with the rest of the world the western countries of Europe have played a preponderant part in the beginnings of progress, that they have been the centres of development? Certainly not, for we are ignorant of what has passed in other parts of the world, not only in the continents as we know them—as they now stand emerged from the oceans—but also in those vast regions which to-day are sunk in their depths and whose former existence we can only suspect. We have no right to deduce laws from our imperfect knowledge of some few millions of square miles, and apply them to the entire world. We cannot judge of the innumerable migrations of primitive peoples, nor classify those human waves which, like those raised by the wind on the face of the waters, have spread over continents and broken against mountains, from the mere study of a few rare skeletons and local industries. We cannot deduce the world movement of glaciers, or judge what were the convulsions of our planet's surface—great movements, varying infinitely according to time and place, and which played so considerable a part in the destiny of primitive man—from localized

geological observations in certain fields which happen to have been more closely studied than others.

Nothing indicates to us, up to the present, the original homes of the various human groups, and the evidences of primitive migrations are few and far between. Darkness still envelops the cradle of our own civilization ; how, then, can we speak of the origins of those peoples whom we know only by the products of their rude industry ?

We must not seek to give to prehistory a precision which it lacks. Let us always remember that here we find ourselves face to face with the unknown in its most baffling phase ; that from our local observations we may draw but local conclusions, and that these evidences bear only on times when Man was already in an advanced stage of development.

This is not the place to enter into considerations as to the possible origins of the Human family, since one of the volumes of this series is devoted to that question, and since Marcellin Boule¹ has recently treated the subject in a masterly work with all the fulness it demands ; but, before dealing with primitive industries, it is important to observe that as yet we know only very little about human and animal evolution.

The most ancient geological strata, those in which traces of life appear for the first time, show us an already highly evolved fauna ; this is not because animal and vegetable life had been provided with such advanced organisms from their inception, but because Nature's first efforts have left no trace. The Pre-Cambrian gneisses and granites have certainly known organized life ; but they have transmitted to us no impressions of it. The same is true of human origins ; Man may have existed in Tertiary times. Some day we may find his remains in one of those deposits of bones which, as at Pikermi, Marâgha, Dakota, etc., allow the reconstruction of a vanished fauna, or in the mud of some such lake as Sansan, where bodies swept away by the rivers have accumulated ; but, up to the present, no discovery of this nature supports hypotheses relating to Man and to those primitive implements known as eoliths. These eoliths, moreover, alleged to be fashioned by the hand of Man, are

¹ XXIIIa.

not in themselves conclusive evidence of his antiquity on the earth. We must limit ourselves, then, to taking the human being when he appears to us with certainty, in Quaternary times, just as we take animal development at the Cambrian period. The pre-Silurian fauna is already high in the zoological scale, and Man is already in possession of an advanced state of industry in glacial times; this is all we know. Beyond that a veil of mystery hangs over palæontology and anthropology alike.

Certain privileged lands, such as Chaldea, Elam and Egypt, knew the benefits of writing sooner than the rest of the world. Some six thousand years have rolled by since this dawn, which broke in the Orient, spread its effulgence over the Tigris, the Euphrates and the Nile; but for many centuries it was a dawn that illuminated only its immediate neighbourhood, while the rest of the world remained plunged in darkness. In the end, little by little, drawing ever nearer, this brightness spread, and is still spreading over new regions; but many centuries will pass before all mankind emerge completely from ignorance and barbarism.

In Asia and in Egypt, too, before the appearance of this the greatest of Man's inventions that allows him to record thought by writing, countless centuries must have passed ere he emerged finally from the lower and animal condition, in which he certainly lived in the beginning; before a being naturally endowed with reason could understand himself, and free himself from those of his instincts in opposition to his intellectual and moral development.

* It was then that the powerful factor of aptitude intervened among those countless human families. All these groups were by no means equal in physical and intellectual vitality, whether because the environment in which they lived was uncongenial to their development or because they were condemned to inferiority by heredity.

Here we come up against the mystery of the single or multiple origin of the human race, a problem whose solution we cannot even adumbrate. The descendants of Adam, says the tradition, married the daughters of men. There existed, then, men who were inferior beings; these old memories affirm it and ethnography would seem to confirm their dictum.

What are we to think of the inequality of culture among

the aborigines of the New World—the great development of certain peoples in Mexico and Peru, and the inferiority of certain clans of North America or of certain tribes of the Amazon or the Guianas, of the Patagonians and Esquimaux, and all those inferior peoples that even example has been unable to wean from their primitive way of life? How should we judge those black races which, in spite of the culture they receive in certain countries, furnish only a very small proportion of the individuals who are really men?

That inequality of cerebral faculties which still exists among individuals in the most civilized peoples must also be accepted in Man before history; as in our days, it not only separates one person from another, but applies to the human families as well. Hence the birth of multiple centres of development of varying intensity at epochs we are unable to fix, since the very causes of such development can be assigned neither place nor time. Phases in intellectual progress, comparable with those of the various forms of evolution in animal life, do not exist.

But apart from the greater or lesser cerebral aptitudes in the various divisions of the human race there was another cause of superiority of certain groups over others, a cause certainly predominant in primitive societies—the aptitude for physical development. For in those days, as, often, even in ours, physical force took precedence of intelligence. Just as it does in our day, and even more so, climate then exercised a preponderant influence over human groups, because Man was nearer to nature than he is to-day, and the inequalities in the climate and in the facilities for existence were great. This was the cause of terrible conflicts for the possession of the soil, and of those migrations and movements of which we recover faint traces. What wars were waged then! What massacres were perpetrated! Slavery was the lot of the vanquished, who died out gradually, leaving, through their women, something of their own blood in the veins of the descendants of their conquerors. While races were thus changing, climates and contours were themselves being continually modified, causing new changes in the ethnic nature of the populations.

History is made up of these struggles of men among themselves, of invasions, conquests, subjugations, the dis-

appearance of entire peoples, and the fusion of the conquered with the conquerors. What has become of the Phrygians, Cappadocians, Hittites, Elamites, Urartians, Iberians, Etruscans and so many other nations whose existence is known to us by irrefutable proofs, but of whom we only very rarely find fugitive ethnic traces? They have become dissolved only to constitute the elements of other nations which themselves have often vanished. What a maze of ethnic complications there are in these few thousand years of which we have the history! How can we picture to ourselves the conflicts which ravaged the earth in prehistoric times! We must not mistake for complete enlightenment the information furnished us by our discoveries of forgotten industries, of unknown arts, or human skeletons. These are but faint gleams throwing no more than a very dim light on the existence of our precursors on this earth.

Although this may not be the place to study Man from the point of view of his physical constitution, nor from that of the languages of which knowledge has come down to us, it is nevertheless useful to show in a few words how deceptive these branches of science may be for anyone hoping to rely on them for research in human prehistory.

We do not possess even the vaguest indication of the nature of the dialects spoken in the centuries which preceded, by several thousand years, the invention of writing. The oldest inscriptions known to us, those of Chaldea, Elam and Egypt, shew us languages already perfectly organized, having advanced and even literary grammars, and the same is true of the archaic texts that come to light every year in different countries.

On that day when we discover how to interpret the texts of the Hittites, Minoans, Etruscans, Iberians, Mexicans, etc., we shall certainly find ourselves dealing with languages already well developed, to whatever group they may belong. There is nothing more fascinating than those comparative studies in the languages sprung from the Aryan main trunk, for example, whose branches, though separated for thousands of years from the bole, still enable us to trace a great number of original roots, and to penetrate into the thought, already highly developed, of societies whose antiquity we cannot attempt to measure.

Such research has permitted us to recognize the existence of several groups and even families. There are still certain ancient and modern dialects, however, which resist analysis and do not come under the head of the great divisions, either from the grammatical point of view or as regards roots, but which seem to be survivals of certain languages which were spoken before the arrival in our regions of those human hordes known to linguists as Semites, Aryans and Turanians. Certain of these languages appear to go back to very ancient origins, such as Basque, Iberian, Etruscan, Susian, Urartian, and the languages of the Caucasus called Kartvelian (Georgian, Mingrelian, Laze etc.), forms of speech which have no relation with the old tongues and which it is impossible to relate to any other group; though we have no grounds for asserting that they belong to languages spoken in Quaternary times.

As for those anthropological discoveries which, as they increase, will throw further light on these questions of ancient local ethnography, we feel a certain scepticism as regards conclusions of a general order which some authorities attempt to draw from them; for, if we judge by the miscellany of ethnic elements which have had a place in all countries during the short period of recorded history, we are led to think that during the prehistoric phases the fusions between the various human groups must have been equally important. It is only with difficulty that we have attained to a rational ethnographic classification of existing races, though for this abundant material is available. What, then, are we to think of conclusions drawn from the study of a few rare skeletons discovered here and there, when we do not know whether these men were really the authors of the industries in the midst of which we find their remains, or whether they lived there as a conquered race or as slaves imported from possibly very distant regions? If we were to find, in deposits characterized by remains of Roman culture, the skeleton of a Sudanese Negro, that would not justify us in concluding that Romulus and Remus had black skins and woolly hair. This incertitude springs from so many factors of which we do not even suspect the existence that it behoves us to be very cautious in estimating what populations have preceded us on our native soil.

For the ethnology of the peoples from the beginning of historic times up to our day we can follow but two guides : philology and anthropology ; and, in most cases, the two methods of investigation reach conclusions which are diametrically opposed. A few examples will suffice to demonstrate this.

In the middle of the great Caucasian chain live the Ossetes, a people who use a very archaic Iranian dialect, although for more than two thousand years they were entirely surrounded, on all sides, by people of Kartvelian speech ; but, owing to mixture of blood, they have assumed the physical type of their neighbours. Thus anthropology makes Caucasians of them, whilst philology declares them to be Iranian Aryans.

In Elam, among the nomad tribes, we meet individuals of the purest Susian type, such as are found depicted on the bas-reliefs of three or four thousand years ago. But these people, whose culture is Semitic, are Arabic-speaking Mohammedans. The language of their fathers is lost, but their physical type survives.

We have seen that Cappadocians, Phrygians, Hittites, Etruscans, etc., have disappeared as nations, and have lost their language ; but in fusing with other peoples they have certainly imported into the physique of their conquerors some of their own characteristics ; the same is true of all peoples in all countries.

Without the shadow of a doubt selection operates at all times among human races, and the inferior disappear before stronger groups, better endowed by nature. This selection is operative even in our own time in America, Oceania, and in Europe itself ; why should it not have governed the destinies of humanity in times when the instincts of the strongest were not restrained by philosophical ideas or laws ?

Are not such considerations calculated to make us sceptical of the results of anthropological observations ?

Thus our only truly scientific guides in the study of forgotten peoples are the actual traces of their existence on the earth left by these men themselves—the débris of their daily life as it has accumulated in the caverns they inhabited, in the ruins of their artificially-constructed homes and their places of encampment ; whilst, for the most ancient periods, we must often search in the alluvial deposits of rivers which,

after scouring the earth's surface, spread over it the débris carried away in their course. Our observations in this respect are necessarily localized, and each prehistoric station has to be the object of a special study. Then, as our observations multiply and the same phenomena appear in a great number of places, we are led to extend our conclusions and to apply them to entire districts. The stratigraphical study of beds in which we find the remains of human industry is our only means of establishing a relative chronology of any given region.

But stratigraphy, the data of which are often debatable as regards geological marine layers, when the succession presents gaps, becomes still more uncertain in the case of Pleistocene and recent alluvia, so that, according to the data of the districts on which they have based their observations, geologists vary in their conclusions. Thus they differ on the number of glacial advances and retreats, as well as on their importance. Some admit but three¹ whilst others² postulate six. They do not even agree on the subject of the glacial period in which products of human industry appear for the first time—those of the Chellean type. Obermaier, for instance, after a profound study of the Pyrenees region is led to place this epoch, and in consequence the antiquity of Man on the earth,³ considerably later.

These divergences of opinion are due to the extreme complexity of the bases on which the deductions rest: here are alluvial gravel beds; there moraines in their lateral and frontal variations; and there again peat-bogs; and the various evidences of glacial action are usually independent and much separated from one another.

Moreover, it is probable that identical phenomena did not everywhere coincide in time. The glacial oscillations undoubtedly correspond to the movements of the earth's crust, nevertheless they have not everywhere affected those mountain masses on which snow was deposited. It is true that the general subsidence of the Scandinavian continental ice marked the close of the glacial, and the commence-

¹ Penck and Brückner, **LXXIII**; Obermaier, *Le Quaternaire des Alpes et la nouvelle classification du Prof. A. Penck*, VI, 1904, 26.

² J. Déchelette, **XXVI**; 1908, I. 36.

³ Obermaier, *Beiträge zur Kenntnis des Quartars in den Pyrenäen*; AfA, 1906, IV, 299 and 1906, V, 244.

ment of the modern period ; but the sinking of the northern continents has certainly not affected their own series of massifs as a whole.

However, the uncertainty which hangs over the glacial epochs has not discouraged the partisans of a very high antiquity for Man on our earth ; and some of the most judicious minds, men deeply versed in the evidences of geology, have allowed themselves to be led into estimating in thousands of years the periods in which humanity passed its infancy. To begin with they made the great mistake of accepting the different phases of prehistoric industry as synchronous, taking for basis the discoveries made in Western Europe : hence their estimates, not resting on any scientific foundation, inevitably gave the rein to fancy.

Goldschmidt, following Haeckel, puts the appearance of living organisms at one thousand and four hundred million years before our day ; while the Cambrian fauna, the earliest of which we have knowledge, was preceded by other forms, whose importance we have no means of measuring, still less their duration. Credner¹ estimates geological time at a hundred million years, three million for the Tertiary and five hundred thousand for the Anthropozoic or Quaternary.

Gabriel de Mortillet² puts the duration of Quaternary times subsequent to the appearance of Chellean Man at two hundred and thirty to two hundred and forty thousand years, of which two hundred thousand are assigned to the glacial epoch and its oscillations, and thirty or forty thousand years to the post-glacial.

According to Lyell,³ Croll⁴ and Lubbock,⁵ Chellean Man is three-hundred thousand years old. Lyell⁶ considers that the formation of the Danish peat required sixteen thousand years, while Stenstrup⁷ reduces this to four thousand.

Every possible means of estimation has been pressed into service to give us a chronology—astronomic observation, the study of glaciers, peat beds, bog formation, river drift,

¹ **XXV.**

² "Evolution quaternaire de la pierre," **VIII** ; 7th year, 1, January 15, 1897 ; G. and A. de Mortillet, **XL**.

³ **XXXII**, 334.

⁴ *Geol. Mag.*, 1867, 172 ; "Climate and Time," 1875, Chap. xix.

⁵ Lyell, **XXXIV.**, 1, 275.

⁶ **XXXIII**, 21.

⁷ **LXIV.**

and the scooping out of valleys, the transformation of uranium into helium,¹ etc., etc., but all the data in this problem are incomplete, and the best proof of it is that the proposed chronologies do not agree among themselves.² One of the most curious miscalculations is that of Broca. After having ascertained that between the caves of le Moustier and la Madelaine, in the valley of the Vézère, there was a difference of twenty-seven metres, Broca wrote: "This scooping out of twenty-seven metres, due to the action of the water, occurred under the eyes of our troglodytes, and, since then, for the whole duration of the modern epoch—that is to say during hundreds of centuries—it has made but little progress. It may be judged, therefore, how many human generations must have gone by between the epoch of le Moustier and that of la Madelaine."³ On the one hand there had only been, since the period of the highest caverns, the excavation of a valley in light deposit, and on the other, if nothing had happened since this was completed, it was because the river had accomplished its maximum fall.⁴

Is there any need to dilate further on this subject? We think not. The diversity of the estimates arrived at suffices to indicate that it is better not to launch out into speculations of this nature. Moreover, even where we know the chronological value of the various layers, as in the tells of Chaldea and Egypt, such estimates can but be peculiar to each deposit studied, for the rate of accumulation at different points is essentially variable. The city of Sûsa, which has probably existed from six thousand to six thousand ~~five~~ hundred years from the time of its foundation to the abandonment of its site by the Arabs towards the fifteenth century of our era, has left a mound thirty metres in height at the highest parts; whereas at Memphis the level of the ancient Egyptian empire, about five thousand years old, lies at a depth of nine metres from the top of the mounds; and near ancient Cairo we see mounds due entirely to the Arabs of the middle ages reaching a height of twelve to fifteen metres.

¹ Cf. Ed. Perrier, *The Earth before History*, p. 32 ff.

² Cf. XXXVII, 24 ff., chronology.

³ XIII. *Congrès de Bordeaux*, 1212.

⁴ XXXI, 1728.

Under any circumstances the data furnished by the superposition of débris from human habitation should be taken into consideration with extreme prudence.

The plan, in section, of the valley of the Nile (Fig. 1) shows the general distribution of the prehistoric and historic evidence in one of the oldest countries of the world; better than any explanation, it enables us to understand the impossibility of basing a serious chronology on the depth of the alluvial beds and deposits, just as in the case of sites, which vary infinitely. There is nothing, not even the thickness of the annual nilotic layers, which does not change with each flood. The inscriptions accompanying the arrows marked by the priests at the temple of Karnak, at the time of the inundations, leave no room for doubt in this respect.

Among the phenomena which have had the greatest influence on the destinies of the human race, first place must be given to the natural modifications of the surface of the globe—oscillations of the terrestrial crust which have been not only the chief contributing cause of glacial cataclysms, thus modifying the climate of the inhabited portions of the globe, but have also caused entire continents to disappear beneath the ocean and have cut the communication between places which to-day are separated by the sea.

The proofs of these oscillations of the ground are indisputable. Submarine valleys, hollowed out in former times in the open and met with to-day on all the coasts of Northern Europe, evidence considerable sinking of the land. The submarine fossa of Cap Breton proves a subsidence of the Gascon shore of approximately a thousand metres (Fig. 2).¹ The same is true of the North Sea plateau (Fig. 3) and of Iceland (Fig. 4). There has been recognized on the coast of Norway the existence of a plateau, now situated at a depth of about a thousand metres, which formed in ancient times the shore of the peninsula. The maximum elevation of the Scandinavian massif at the close of the Tertiary period reached to 4000 metres at the least. Scandinavia is in the same latitude as Greenland and certainly was not warmed, during the Quaternary period, by marine currents such as the Gulf Stream. So far as atmospheric condensation goes,

¹ According to some geologists the cracking of the surface has played an important part in the scooping out of this valley.

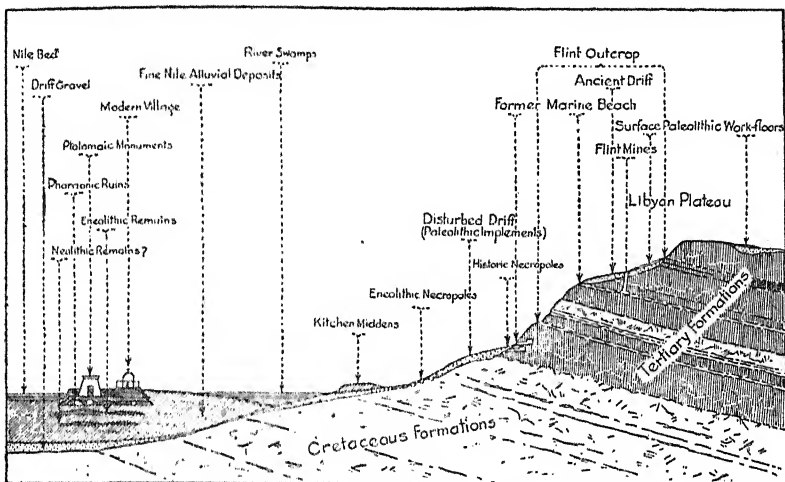


FIG. 1. Imaginary section of the valley of the Nile.

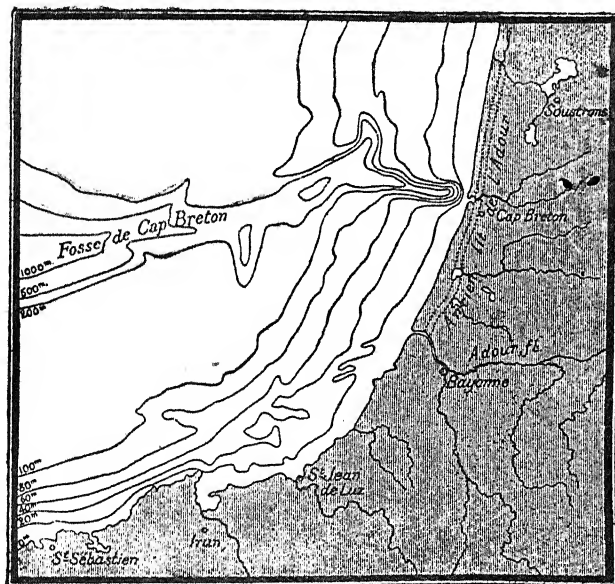


FIG. 2. Cap Breton Fossa.

its condition was then analogous to that of Greenland, one of whose highest peaks, Mt. Petermann, reaches a height of

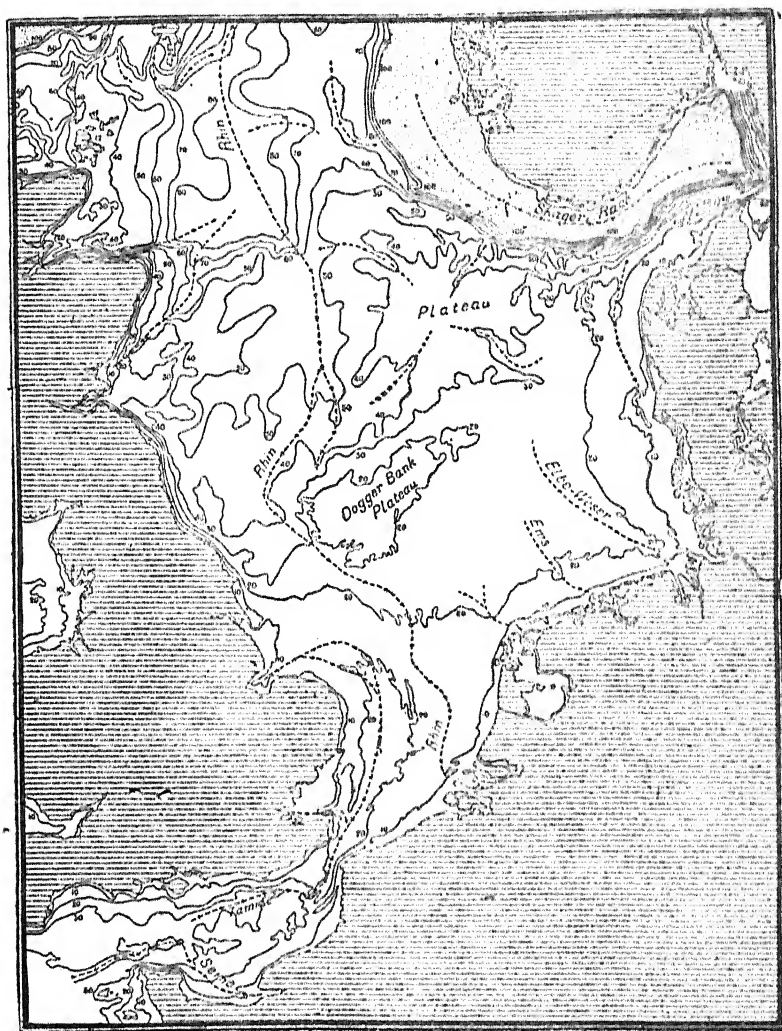


FIG. 3. Submarine Plateau of the North Sea.

3480 metres. But whereas Greenland is surrounded by seas which absorb its ice in the form of bergs, the Scandinavian massif, bounded on the south by the plains of Western and Central Europe, and on the east by those of Russia, had a

clear field for the development of glaciers which extended into temperate regions without meeting any obstacle (Fig. 5). In the same way the mountains of New Zealand,¹ 3000 metres in height, send their glaciers right into the midst of the forests of tree fern.²

In order to gain some idea of the Scandinavian inland

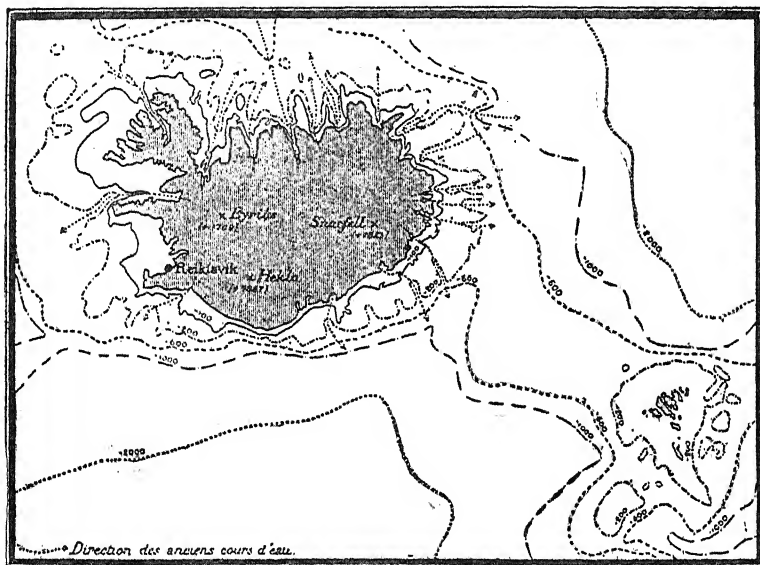


FIG. 4. The submarine valleys of Iceland (Directions des anciens cours d'eau = direction of ancient rivers).

ice during Quaternary times, we cannot do better than glance at the present glacial phenomena of Greenland.

The plateau of this peninsula, averaging 1000 to 1500 metres in height (the altitude of the Scandinavian plains in glacial times), and comprising some lofty peaks, is an immense reservoir for the precipitation of snow-packs, even during the summer. These snows are transformed into ice by the pressure brought about by their own accumulation, and this ice is constantly moving down the flanks of the plateau seawards; there it breaks up into icebergs which are carried away by the prevailing wind towards Newfoundland.

Although the rise of the slope down which these glaciers

¹ E. C. Andrews, "The Ice-flood Hypothesis of the New Zealand Sound-basins." **XVIII**; 1906, XIV, 22-54.

² Cf. **XLVI**; 53; **XXXIV**, II; Lartet, **L**, 150.

move is not more than $0^{\circ} 30'$, the pressure from the centre is such that the rate of advance is beyond anything known in our latitudes. The glacier of Iakobhavn advances in July at the rate of 19 metres in twenty-four hours,¹ that north of Upernavick moves 31 metres a day and that of Torsukatak only 10 metres.

This irrefutable evidence authorizes us to believe that the Scandinavian glaciers, following wet periods and as a result of

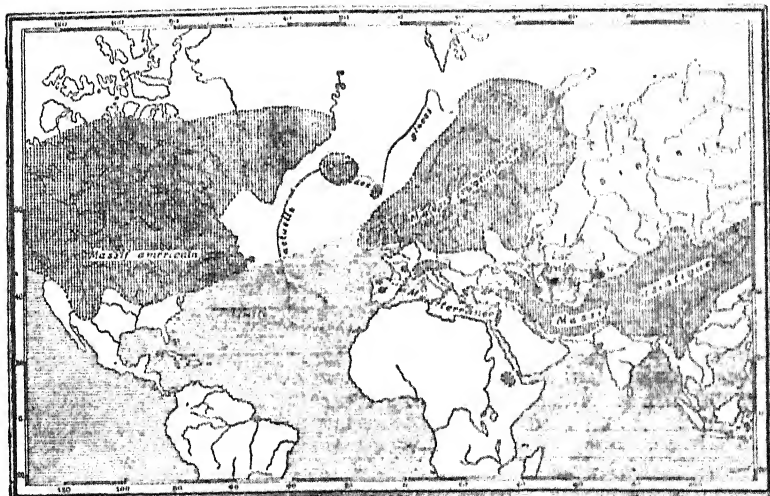


FIG. 5. Maximum Extension of Pleistocene Glaciers.
(*Limite actuelle des glaces*=present ice limit).

great falls of snow, may sometimes have advanced on Central Europe at the rate of six to eight thousand metres a year. Hence a couple of centuries would more than suffice for ice from the highest summits of the Scandinavian chain to reach the site of the present-day Brussels. These glaciers, which advanced or retreated according as climatic conditions were more or less favourable to the condensation of atmospheric humidity during the preceding years (this again depending on the occurrence of more or less important oscillations in the earth's crust), penetrated to the most fertile parts of the continent.

But the subsidence of the surface, which brought about the cessation of the more extreme phenomena of glaciation,

¹ Cf. Helland, *Pet. Mil.*, 1887.

still continues. Maybe it proceeds more slowly, yet it still makes itself felt on occasion, as prehistory and even history record. In the bay of the Morbihan, the dolmens and circles of the isle ErLANIC, near Gavr' Inis, are to-day under water and visible only at low tide (Fig. 6). The formation of the Zuyder Zee and Lake Grandlieu, and the disappearance of the town of Ys, are evidences of the gradual sinking of our coasts, as is also the separation of the Channel

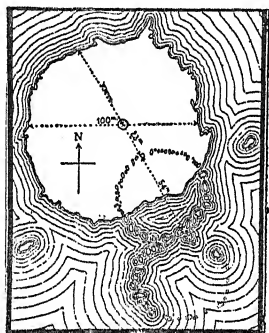


FIG. 6. The Isle ErLANIC (Morbihan).

Islands from the continent, and many more examples that could be given.

These modifications in the contour of the land go hand in hand with climatic changes which inevitably resulted therefrom. The winds and the ocean currents themselves have changed, and, where the ice extended, its melting caused a considerable lowering of temperature. These modifications certainly did not come suddenly; they were gradual, interrupted by periods of stagnation, and throughout those centuries of time Man and the animals fled before the ice or adapted themselves gradually to the new conditions of life. It was thus that the great pachyderms whose bodies we find in the Siberian ice, and those also of our own country—if we judge by contemporary representations of them—gradually acquired their woolly coats. The flora had changed, and the mammoth fed on the young shoots of the larch. Man, too, probably protected himself against the rigours of the climate, for one sees, on the Magdalenian carvings depicting him, hatchings which seem to indicate long hair. Driven from regions invaded by the glaciers, he retreated towards

the south in search of a milder climate and more favourable conditions of existence ; then he returned to settle in his old haunts when the glaciers abandoned them, retiring again on their fresh advance—ever moving at the bidding of the ice ; finally, when the great thaw came, he occupied those areas we inhabit to-day, and others whose former existence we do not even suspect.

Certainly bridges to Africa existed then in the Mediterranean and maybe the New World was connected with Europe by Atlantis or some other vanished continent. There are not wanting certain regions whose zoological affinities with other parts of the world invite us to link them together in thought or at least with continents swallowed up in the not far distant past. Although the veil of ignorance still shrouds from us most of the changes in the earth's surface contemporary with Man's existence, we can yet observe the tremendous influence that these great natural phenomena have exerted on the destiny of humanity.

The causes of human migration are many and complex, and even more numerous in modern times than in those distant epochs when our ancestors sought only to satisfy their material needs. To this motive force to-day is added the thirst for riches. The expansion of the European race over the entire face of the earth, together with the disappearance of human families of inferior culture, is due to the attraction exercised on the mind by gold. But in the days when the precious metal was no better than a valueless rock, considerations of climate, fertility of the soil, and desirability of hunting and fishing grounds, guided the steps of invaders, and the men of the North, accustomed to conflicts with the elements, speedily dominated those populations which an easy life had rendered somewhat lacking in ardour. Then, little by little, the conquerors themselves lost their virility and were no longer capable of defending their territory against new invaders coming from regions less favoured by nature, who were thus superior in physical force.

It is invariably the case that conquered peoples take refuge in places where they hope to be able to preserve their independence, as in mountainous regions, in islands or peninsulas, or in arid districts. History, and the distribution of the different human races peopling the earth demonstrate

it, and, moreover, it is strictly logical. The Celts retreated to the Breton peninsula, to Cornwall and Wales; the Basques inhabit the Pyrenees; the Kurds, formerly masters of all the northern portion of the Iranian plateau, to-day are limited to the great mountain chains bordering Persia; whilst every valley of the Caucasus is occupied by a tribe speaking a different language, and so forth. Thus, we must not deduce from discoveries made in districts difficult of access the contemporaneous culture of the population of the neighbouring and more open regions.

The invasions of historic times have been innumerable and continue in our day, especially the destruction of other peoples lacking in defence, which has gone on since the times when the Semites, absorbing the ancient elements of the Chaldean population, marched towards the North and founded Assur and Nineveh, haunts from which they came out every year to crush those peoples less proficient than themselves in the profession of arms. Six thousand years of history bear witness to man's instinct for destroying his fellow man. What is to be said of these successive human waves from the uttermost parts of Asia which surged and beat on the walls of the Roman world?—of the colonial conquests of Spain, England and France,—of these invasions, in the name of civilization, of lands where men once lived content in their freedom, natives whom we daily dispossess because they are weaker than we, and because the natural wealth of their soil attracts us?

Every invasion of the West in historical times seems to have been launched from the north and centre of Asia, when the world still presented very much the same physical appearance it does to-day, but we cannot tell what its contours were in prehistoric times. Many authors have indulged in hypotheses relating to the cradle of the different human groups. They have given to the Aryan-speaking peoples as their birthplace first the Altai, then Transcaucasia, then the plains of Russia and Siberia; they have made those who spoke the Semitic tongue come from Arabia; in brief, every possible supposition has been made, but many of them are absolutely gratuitous, because the story of Man's distribution on the earth depends on a number of elements of which we know little. Prehistory is still surrounded by too many mysteries to entitle us to approach scientifically the great

problems connected with the place of origin of our species. Moreover, the very terms in use for description of this part of human history, for which written documents are absent, are in themselves vague and lacking in precision.

"Prehistoric archæology," one says, "is the science of antiquities previous to the earliest historic documents."¹ This generally received definition nevertheless is incomplete, since it applies only to countries which have possessed written documents for centuries, and leaves out of account those barbaric peoples which, up to our own days, have lived outside history. It would seem to include only the earliest antiquity.

We should recognize the expression "prehistoric"—giving to it its full value both in time and in place—as covering all peoples and all those questions of man's existence of which written documents by the people concerned are wanting. It applies equally to the most remote as to contemporary times. For it is impossible to separate ethnography, that is to say the study of modern homogeneous groups, either from that of the peoples of whom classical writers speak, or from the study of men known to us only by examination of the traces they have left—men whose very name is lost to posterity. It would be more exact to say that the study of archæological prehistory deals with all those peoples who have not themselves bequeathed to us their annals. Thus the Germans whom Tacitus describes, the Gauls of whom Cæsar speaks, the Huns concerning whom Ammianus Marcellinus furnished so many details, the Silures and other island peoples of whom Herodian tells us, the Kamchadales of Pallas, and the Tahitians of Cook and de Bougainville, are prehistoric peoples although living in times when other nations were already writing their history. We might say that ethnography merges into prehistoric archæology, since it begins with history itself: there is not a page of the Assyrian, Egyptian, Greek, or Roman annals that does not speak of barbaric peoples, or of those legendary traditions in which the actual history of every race has its origin during the prehistoric phase of human evolution. It is from the sum total of archæological and ancient and modern ethno-

¹ XXVI, I. 1.

graphical documents that we draw our knowledge of the first inhabitants of the earth to-day.

The archæology of the prehistoric remained a mere subdivision of ethnography until it was perceived by the aid of geology that traces of man in the alluvium, in caverns, in the soil,—more or less everywhere—contributed materials of great importance to the study of origins. From that time forward ethnographic studies have been lavished on these remains, under the new name of “proto-history,” a fabricated word doing more harm than good, since it claims to be definitive whilst actually it brings confusion. Thus usage has sanctioned the terms “prehistory,” “proto-history,” and “ethnography,” to indicate divisions in a group of studies itself nameless: yet in spite of these complications the terminology remains incomplete.

The prehistoric branch of ethnographic studies began as a French science; and is still in great honour in our country since the earliest discoveries, together with their interpretation, were the work of our archæologists. The juxtaposition of evidences of human industry with fossil animal remains in the silt which has filled caverns has been recognized and recorded from the first years of the eighteenth century. Most authorities, however, following the example of Cuvier, explained this association by the hypothesis of a disturbance of the ossiferous beds within modern times. This was making the exception the general rule. However, the evidences multiplied, thanks to the researches of Boué, Tournal, Christol, Joly, Schmerling and others.¹

In 1828 came the discoveries of Tournal and of Christol in the Languedoc; in 1833-1834 those of Schmerling at Liège; and in 1837 and 1838 those of Édouard Lartet and Marcel de Serres, confirming the existence of Quaternary man in France. The thinking world still showed itself incredulous when a few years later, about 1850, Boucher de Perthes decisively demonstrated the simultaneous presence of bones of the larger extinct mammals—Mammoth, Hippopotamus, Rhinoceros, etc.—and the unquestionable products of human industry in the Somme alluvium near Abbeville. Boucher de Perthes at first encountered lively opposition

¹ **XXVI**, I, 6. Cf. **XXIV**, 2-25; **XLII**, I, 1; **XXIX**, 44.

on the part of authorities both in France and in other countries; but he defended his opinion with untiring energy, continued to accumulate proofs in support of his statements, and gradually converted the most eminent geologists and zoologists of his day, both French and English. Falconer, Sir Joseph Prestwich, Sir John Evans, Lyell, de Quatrefages, Albert Gaudry, Rigollot,¹ etc., became the most ardent defenders of the new theories. When Boucher de Perthes died in 1868 he had had the satisfaction of seeing his name immortalized by one of the greatest archaeological discoveries of modern times.

Since then investigations have been pushed with great energy by a large number of archæologists both in France and in foreign countries, especially in England. Édouard Lartet and the Marquis de Vibraye, joined by the Englishman Christy, continued their fruitful excavations in the caves of the valley of the Vézère. In Belgium, as early as 1864, E. Dupont explored the caverns in the neighbourhood of Dinant.

Édouard Lartet was the first to lay the bases for a classification of the Quaternary strata in France. The Saint-Germain Museum was established by Napoleon III, and the curator, Gabriel de Mortillet, by his remarkable work,² became the chief authority on prehistoric archæology for half a century. Since then there have been Éd. Piette, L. Capitan, M. Boule, the Abbé Breuil, d'Ault du Mesnil, Adrien de Mortillet, and a constellation of archæologists in France who have daily made fresh contributions to the study of prehistoric man, whilst in England there have been Lyell, Christy and Evans.

In Denmark, as early as 1836,³ Christian Thomsen had classified the mesolithic and neolithic series of that country in the galleries of the museum at Copenhagen; Worsæ later gave scientific method to this classification. Prehistoric archæology rapidly won its way all over Europe as far as Russia, and crossed the Atlantic.

In Egypt, long before my own discoveries, the most

¹ LVIII.

² *Essai de classification des cavernes et des stations sous abri, fondée sur les produits de l'industrie humaine*, XIV, LXVIII, March 1, 1869.

³ *Ledetraad til Nordisk Oldkyndighed*, 1836.

eminent Egyptologists denied the existence of a stone age in the valley of the Nile, and this opinion was so firmly fixed in their minds that Maspero classed (eneolithic) painted vases as Middle Empire, and Flinders Petrie¹ explained the presence of worked flints, which he found in his excavations, by the invasion of the valley of the Nile by a "new race" in historic times. In this same year, 1896, I published my first volume on Egyptian origins, annihilating these theories, and was immediately followed by Flinders Petrie himself. The next year, pursuing my researches, I discovered at Nakadah itself, the eneolithic sepulchre of Menes, the first king of the first dynasty.²

In Elam, as early as 1891, I had recognized the existence of the neolithic (or eneolithic), and established the fact that the Iranian plateau, covered with snow during the glacial period, had not been inhabited until fairly late.

In Syria, Zumhofen, Vincent, Lortet and other archæologists have explored the caverns with great success; in India the existence of palæolithic industry has been recorded by the Archæological Survey; in North Africa likewise the studies in this respect have been conclusive. Seton Karr explored Somaliland with great success.

In short, in half a century at the most, this science, born in France, has made the circuit of the world, and has spread to every continent.

In parts of the world other than Europe, in America, Oceania, central and southern Africa, prehistory merges into ethnography; since, for the most part, the peoples of these regions were still in a state of primitive culture when the European navigators appeared. Among many of these peoples the polished stone industry was flourishing, whilst others were in the stage of chipped stone implements. The persistence of the use of stone and the ignorance of writing among a large number of tribes brings prehistory to our own times. Thus we cannot assign dates to these industries unless we consider them from the purely local point of view, for no chronological connection can exist between events which have taken place in our country and those to which Australia, for example, bears witness. These different and,

¹ Messrs. Flinders Petrie and I. E. Quibell, *Nagada and Ballas*, 1896.

² J. de Morgan, *Recherches sur les origines de l'Égypte*, 1897.

as we shall see later, most diverse industries, each have their epoch and their geographical area.

The study of primitive peoples living in our own day, and thus coming within the range of modern prehistory, is extremely useful in helping us to an understanding of the customs of the earliest inhabitants of our country. Since like cause begets like effects, and seeing that these causes were simple ones dictated by material needs, we may safely explain ancient customs by those still in vogue when like industries have been born of both.

When, in the eighteenth century, Pallas¹ visited all the peoples then living in the Czar's domains, he encountered, towards the extremity of Eastern Siberia, the tribe of the Voguls, who inhabited caverns and lived by hunting and fishing alone, not applying themselves to any sort of culture. In times of dearth these people pounded bones and extracted a sort of broth by cooking them.

He also saw the Chukchi who inhabit that peninsula situated between the Siberian Arctic Ocean and the Behring Sea, within the Arctic Circle. These men were living, as were formerly all the Kamchadales, in underground dens and rock shelters, closed by hanging reindeer skins in front of the entrance. They did not then possess any metal implements; their knives were of sharpened stone, their awls of tapering bone, their eating and drinking vessels of wood or leather; for weapons they had bows and arrows, pikes and slings; the pikes and arrows were tipped with pointed bone.

The women tanned the skins of animals killed in the chase, scraping them to remove the hair, after which they rubbed them with fat and fish-roe, then they pommelled them energetically. Sinews of beasts, pointed bones and needles made from fish bones served them for sewing.

Not far from the Chukchi and other Kamchadale peoples, tribes even less civilized were living on small islands, whom Pallas designated under the name of Eastern Islanders. These men, like the others, lived on the game they killed, and their women, too, tanned the skins and prepared the pelts. They had no domestic animals, not even dogs. Armed with spears and bows, with arrow-points of bone, they passed

their lives in hunting, having no other occupation than to feed themselves.

The habitations of these people were underground dens, sometimes a hundred metres long by six to ten wide, divided into compartments. Here were herded together as many as three hundred people, in the most abject filth; others lived in caverns and shelters which they endeavoured to close with driftwood.

Reading this description, we might well imagine that it dealt with Quaternary man in the caverns of Périgord, with this difference, that our Magdalenians were artists who embellished the walls of their homes with drawings, and that quite certainly their refined tastes were manifested in their ornaments, perhaps even in their dress; though none of their belongings not made of bone or stone have survived the ravages of time, and we are ignorant of most of the articles they must have possessed.

Pallas's description shows us the life of primitive man in one of the rudest climates of the world, whereas the navigators of the seventeenth and eighteenth centuries tell of peoples living under a more clement sun, devoting little thought to their subsistence, which nature provided in abundance. Elsewhere in the virgin forests of Southern Asia and South America man has a harder struggle for his livelihood.

I travelled and lived for several months among the Negritos of the interior of the Malay Peninsula¹ at a time when no European had yet penetrated into the heart of the territory of these tribes. These peoples, sparsely distributed, in clans, each speaking its peculiar dialect, live in the valleys of steep mountain ranges, whither they retreated before the invasion of the Malays of the Plains. There, in the heart of limitless virgin forests, they build large common dwellings, fifteen or twenty metres in length, made of a simple pent-roof, of interlaced leaves of the cabbage-palm, resting directly on the ground. Their costume consists of a loin-cloth made of bark rendered supple by beating; for weapons the Sakais have spear and blow-pipe; the Semangs, bows and pikes; arrows and spears are tipped with sharpened bamboo coated with a potent poison. They live by hunting and on tubers

¹ Cf. J. de Morgan, in *l'Homme*, 1885.

which they find in the forest ; those who dwell in proximity to Malay villages cultivate the manioc. They possess no metal implements other than those procured from the Malays, and they have no salt. Such social groups will disappear without leaving any archaeological trace of their existence.

It is impossible for us, in our civilized western lands, to form any very precise idea of what hunting and fishing are like in these primitive and little-inhabited countries, or even in our own, in times when man did not possess the powerful means of destruction he uses to-day. In Europe game has become very rare and shooting is a luxury ; as for fishing it no longer exists except in name ; but when we travel through new countries in which wild animals have been barely disturbed, we can realize what the resources of our own lands must have been before civilization had reduced them practically to nothing. All sorts of game, large and small, abounded, and there were huge fish in the rivers, so that it was easy enough to catch one's meat in the course of a few hours. Caverns and other sites of prehistoric encampment are full of bones, cracked for the extraction of marrow, and of remains of fish. Conditions were very different from what they are to-day, and the sparsely-settled peoples did not have to make any great effort in order to gain their livelihood.

However, the climate changing, resources became exhausted or so altered in nature as to compel men first to modify their implements, then to emigrate if life became too difficult. Thus, by a gradual process of desiccation, many parts of North Africa and Syria have become uninhabitable.

At El Mekta, near Gafsa, at Jénéyen, in the extreme south of Tunis, and in many other places in the "bled," I found prehistoric stations in places to-day deserted ; and, in the same shelter one may see layers formed of bones, yielding traces of rude flint implements, covered by others where we find only a prodigious quantity of helix shells, and very small flint implements greatly resembling those known in France as Aurignacian. To the hunters of moderate-sized game had succeeded eaters of snails. Then they, too, departed.

These climatic modifications, although occasionally extensive geographically, were not always followed by identical

results ; thus it would be risky to attempt a generalization of the consequent modifications on human industry, just as it would be dangerous to synchronize two somewhat similar industries with no other reason than the analogy of form, since these forms may be determined by like circumstances in different countries at very different times. Moreover, we should not lose sight of the fact that, except in Egypt and Peru, we possess but an insignificant collection representing the culture of those days, objects of imperishable material ; stone in plenty, bone and ivory sometimes, but never horn, wood, or other perishable substances ; therefore we should be most circumspect in assimilating two different cultures on the mere evidence of stone implements.

If we are to believe certain writers, the different stone industries have had each their centre of development, gradually gaining ground till they covered immense regions—all Europe, according to some. Formerly this propagation of types was attributed to migrations and invasions ; to-day we are led rather to recognize commercial influences in this diffusion. It is possible that all three causes are often involved,—but it is even more probable that the centres of invention have been multiple ; no cogent reason or shadow of likelihood lends support to the choice of France as the site of successive centres of civilization, merely because these centres happen to have been the most thoroughly studied.

That a discovery should spread through lands apt for its assimilation is not in itself surprising ; we must not on that account credit an impossible energy to this power of expansion, especially in times when communications between distant countries were difficult, and often impossible, and when needs were different in different parts.

Hence it is not desirable to presume a world-wide importance for the many classifications proposed ; we should rather consider these terms as expressing a local condition of culture, varying in area, it is true, but always limited. In many cases there is nothing to prove that the various industries of the same type were everywhere contemporaneous. Hence, in order to avoid confusion, and generalizations for which there is no authority, it will be useful to add to the designation of the type, Acheulean, Moustierian, Magdalenian, etc., a geographical name permitting localization,

such name being capable, moreover, of expressing wide areas in cases where synchronism may be established by unquestionable proofs drawn from stratigraphy—but not from palæontology alone, since, in the course of the glacial oscillations, animals have certainly changed their habitat without Man having necessarily followed them in their migrations.

The inequality in the state of preservation of these primitive cultural remains in different stations is the cause of considerable difficulty when it becomes important to establish comparisons. The alluvium yields us only stone implements, as do the stations in the open; but we know nothing of other objects of culture which may have accompanied the Chellean, Acheulean and Moustierian types of the north of France. In order to establish their succession, we take as a basis the relative position of the alluvial beds, though we are unable to affirm that successive streams have followed the same path and thus washed successive stations. It may well be, that running through different areas before superposing their contributions, these streams have simply swept up worked flints that are contemporaneous, but which came from different stations, belonging to distinct types of culture; the superpositions in the alluvium of Gafsa in Tunis are conclusive in this regard.¹

If, in the preceding pages, we have called attention more especially to the numerous uncertainties to be met with in the documentation on which the study of prehistoric culture is based, it is owing to the fact that this kind of research is quite common, and that studies are constantly being published in which the authors allow themselves to be carried away and to launch a whole crowd of frequently unscientific hypotheses. Real progress, it is true, occurs every day, but we need not believe that our information on the question yet authorizes the establishment of a relative chronology analogous to that which we have in geology. The various formations of the earth's crust being successive, the geological difficulties are to be found only in the search for synchronisms.

It cannot be the same in prehistory, since the evolution

¹ J. de Morgan, *Sur l'incertitude de la chronologie relative des faits pré-historiques*; VI, 1907, 380-383.

of humanity towards progress differs according to place as well as time and the aptitudes of Man himself. It is only by the infinite multiplication of observations that prehistoric fields corresponding to each cultural phase will be established ; but in order to do this every country throughout the world must be studied with as much care as has been expended on the western and central portions of Europe—an immense task demanding much time and effort. The collection of worked flints is a pleasant hobby to which thousands of amateurs devote themselves, but to make the observations that will teach us something of the relative dates of these different cultures is the work of experts and demands a varied knowledge which few collectors possess.

PART ONE

THE EVOLUTION OF INDUSTRIES

PART ONE

THE EVOLUTION OF INDUSTRIES

CHAPTER I

PALÆOLITHIC INDUSTRY

Eoliths.—Man certainly gave thought to the provision of means to strengthen the power of his arm in attack and defence when his brain had not yet developed much beyond the animal stage. Then, gradually, the idea came to him of adapting to his needs such weapons as his environment furnished; the branch of a tree, broken off to a convenient length, served his purpose; and from stones, roughly fashioned and provided with an edge, he made those rude implements to which the name eoliths has been given. These primitive implements present, however, such close resemblances to “sports of nature” that, although their existence cannot be doubted, it is impossible to distinguish them with certainty from stones split and flaked by natural forces. Certain archæologists believe it possible to say definitely that these primitive tools were used in Tertiary times. The Abbé Bourgeois, in 1867, thought he could distinguish the marks of human industry on certain flints (Fig. 7, Nos. 1, 2 and 2a) from the Aquitanian level at Thenay (Loir-et-Cher): in 1871, the Portuguese geologist, Carlos Ribeiro, discovered others in the Plaisancian beds of Otta (Fig. 7, Nos. 3 and 3a) (Valley of the Tage); and G. and A. de Mortillet, in their *Musée Préhistorique*,¹ show eoliths from Puy-Courny, near Aurillac (Fig. 7, Nos. 4 and 4a), implements which would belong to the Miocene and like those of Thenay and Otta would be clearly Tertiary. Just recently excavations made at Ipswich, in England,

¹ 2nd edition, plate IV.

have given similar results, but somewhat more convincing, according to the authorities engaged in the research. The greatest defender of Tertiary eoliths was the Belgian geologist, A. Rutot¹, who not only considered them to represent the first attempts of man in the working of flint, but also thought that they constituted a special industry which, beginning in the Pliocene, was continued down to modern times parallel with other stone industries. (Fig. 7, Nos. 5 and 6). No evidence from actual facts, however, has appeared to confirm this hypothesis; indeed, on the contrary, Marcellin Boule, professor at the Muséum de Paris, has conclusively shown² that the industrial mortars of Guerville, near Mantes, in mixing clay and chalk for the manufacture of cement, made eoliths in every respect similar to Rutot's specimens, and consequently that the action of natural forces suffices to produce those effects that have been attributed to human agency.

None the less, it is true that we cannot deny the probability of the existence of an industry greatly inferior to the palæolithic, any more than the probability of human life towards the close of the Tertiary. Unfortunately we know but little of the continental deposits of the Miocene and Pliocene ages, for they were almost all washed away at the time of the great Quaternary inundations, whilst others were swallowed up in the ocean together with the continents on which they had accumulated: nevertheless it is in the humus or mould of these epochs alone that we may expect to discover convincing traces of man and his works.

The Chellean Type.—The oldest implements of which we have knowledge that are quite clearly the work of man are almond-shaped flints roughly flaked on both faces by percussion, and pointed at one extremity, rounded at the other, and slightly convex in the centre.

They differ in dimension and often also in their general form but they are all more or less elongated and rounded, whilst the manner in which they are cut varies considerably. Nevertheless their average length is from ten to fifteen centimetres. These implements were first found at Abbeville and Amiens, in the department of the Somme, then at

¹ VII (1907), VIII, 283; and *Bull. Soc. Belge géol.* (1907) XXI, 211.

² M. Boule, *L'origine des éolithes*; VI (1905), 263.

Chelles in Seine-et-Marne¹, in the Quaternary alluvium (Fig. 8, Nos. 1, 1a and b, No. 2); later they were discovered in the alluvium in the north of France, in Belgium, Taubach², Saxe-Weimar, and the Grimaldi caverns³ near Mentone, as well as in many other parts of Western Europe.

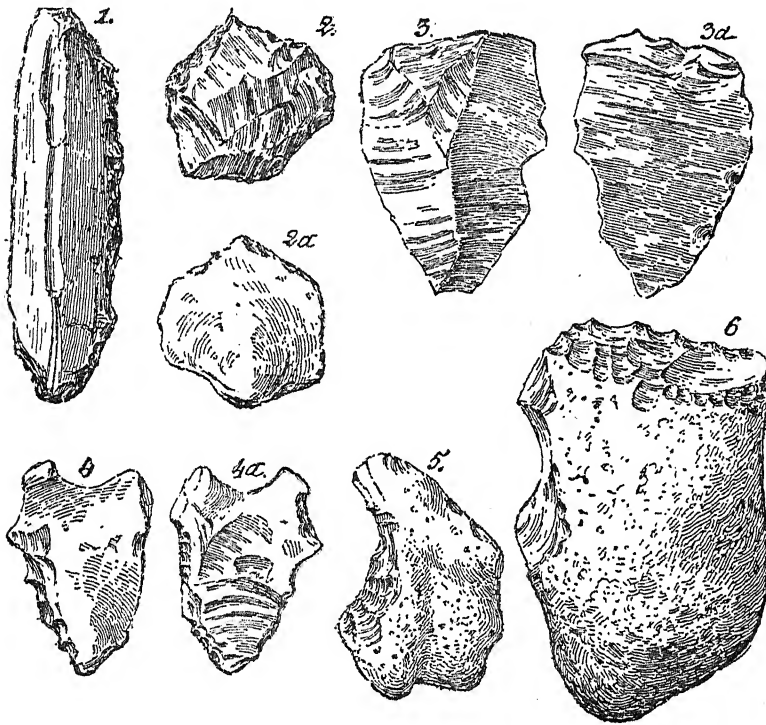


FIG. 7. Eoliths, 1, 2, and 2a, Thenay (Loir-et-Cher); 3 and 3a, Otta (Portugal); 4 and 4a, Puy-Courny; 5 and 6 (Belgium).

In almost all these beds the typical implement, known as Chellean, is found with flaked fragments of indeterminate shape, worked or otherwise, and with others chipped on one face only which archæologists have differentiated as Moustierian. In general all these stone tools are coarsely worked, especially in localities such as the south of France and Saxony where the only materials available were quartzites,

¹ Cf. D'Acy, **I** (1891), 348; L. Capitan, **XII** (1900), 55.

² Cf. Klaatsch, **XLIX**, II, 269; S. Reinach, **VI** (1897), 53.

³ Cf. M. Boule, **VI** (1906), 257; J. Déchelette, **XXVI** (1908), I, 78.

sandstones, quartzes, etc., which do not flake as easily as flint.

Except in a few caverns, implements of the Chellean type have always been found swept into the fluvatile strata, the relative age of which is indicated by the presence of fossil bones. At Chelles they are found with the remains of *Elephas antiquus*, *Rhinoceros mercki*, *Trongotherium*, *Ursus spelæus*, *Hippopotamus amphibius*, *Hyæna spelæa*, and various Equidae related to the Tertiary horse, *Equus stenonis*, whilst, in the drift in the neighbourhood of Abbeville¹, *Elephas meridionalis*, *E. primigenius*, *Hippopotamus major*, *Sus scropha*, *Cervus belgrandi*, *Bison priscus* and several other large vertebrates were also found.

This gives us a fairly accurate idea of the conditions under which these primitive men lived. The flora of this epoch is revealed to us by the tufa of Celle-sous-Morêt (Seine-et-Marne) which frequently bears plant impressions such as those of the Judas-tree, Fig-tree, the Laurel of the Canaries, Box, and the large-leafed Spindle-tree, varieties which are suggestive of a mild and damp climate more temperate than that which the basin of the Seine enjoys to-day.

The foregoing observations apply to one region only, and that a comparatively small area, since it includes but three or four adjacent departments. If, however, we go seven or eight hundred kilometres further east, keeping within almost the same latitude, we find in Saxony a fauna and a flora that is rather different. In the forests of Conifer, Birch and Laurel there lived: *Elephas antiquus*, *Rhinoceros mercki*, *Bos priscus*, *Hyæna spelæa*, all of our own regions, and also *Ursus arctos*, *Sus antiquus*, *Equus caballus*, *Cervus euryceros*, *Cervus capreolus*, *Castor fiber*, and some members of the Goat family as yet unnamed. The climate of Saxony was at that time cooler than that of France—if we grant that the deposits of the Seine basin were synchronous with those of Central Europe.

At Mentone the climatic conditions likewise were somewhat different; for we find in the silted-up layers of the caverns remains of *Ursus arctos*, an animal which does not

¹ D'Ault du Mesnil, VIII (1906), 284.

seem to have existed in our northern countries at that time. We find also in eastern Provence, *Elephas antiquus* and *Rhinoceros mercki*.

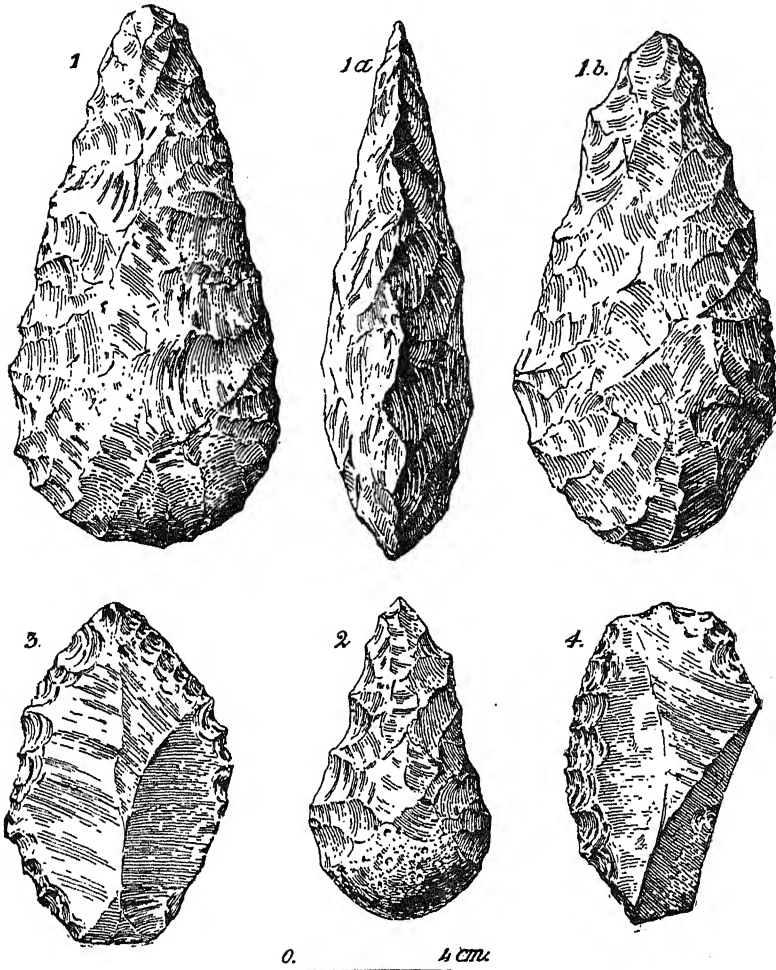


FIG. 8. Chellean Implements.

Whatever may be the character of the layers, we know nothing of Chellean industry beyond its stone tools ; no bone or ivory implement has come down to us, and some degree of uncertainty haunts the very existence of the Chellean as a distinct and typical industry. We have seen that the

Chelles character is almost everywhere associated with another called Moustierian, characteristic of implements long considered to belong to a more recent and more advanced Quaternary industry. On the other hand, the Chellean implement embraces the main principles of the Acheulean axe or "coup de poing" of G. de Mortillet; it is only natural to conclude that if the Chelleans were content with a crude implement, it was because they had not felt the need of more highly finished tools, although they were perfectly capable of fashioning them.

The Acheulean Type.—The Acheulean industry¹ is but a specialization of the Chellean, no doubt determined by circumstances the details of which escape us; but whether induced by local changes, or by climatic modifications on a wider scale which produced fresh needs, is still unknown. If we are to judge by the palæontological data in our country, a distinctly cold period followed the warm or temperate interglacial times in which we find the fauna associated with Chellean industry, and it is perhaps due to this change in temperature that the prevailing use of implements of the same type as the Chellean, but of a more highly finished workmanship, is due. It would seem, moreover, that the two classes of implements were not designed for the same purpose: whilst the Chellean "coup de poing" was intended for striking, the Acheulean axe was designed in such a way that it could be used for both cutting and striking. The implements of Moustierian type which are found in abundance with the Chellean in both the drift and the caverns, prove that the Chelleans did not work their "coups de poing" with greater care simply because they did not find it necessary.

The Acheulean implement (Fig. 9, Nos. 1, 2, and 3) in general is lighter than the Chellean and it is more varied in form; we find a lanceolate form so elongated that it might well be taken for a dagger, whereas others are elliptical, rounded, or even discoid (Fig. 9, No. 4). These diverse shapes are obviously intentional, but we are ignorant of the purposes which determine the choice of form.²

¹ After the name of Saint-Acheul, a suburb of Amiens, where there are important deposits of this type of implement.

² L. Capitan distinguishes eight types of implements. Cf. "Les divers instruments chelléens et acheuléens," **XII** (1900), 61.

The method of usage of the "coup de poing" has been under discussion for years. Taking his stand on the employment of this implement by certain savage tribes who still use it and without a handle, merely smearing the butt (the round part) with a kind of resin to protect the palm of the hand, G. de Mortillet considered that it was used without a handle and held in the hand. Other archæologists, on the contrary, have sought to reconstruct the method of hafting, so that we can merely say that it is probable that these tools were used in several ways. However, it seems certain that it was with the point and sharpened edges only that the fabricators worked, since, among those that are not quite finished off, it is always the butt that is incompletely worked and this sometimes shows the unaltered surface of the flint as it existed before it was chipped (cf. Fig. 8, No. 2); it is never the point that has failed to receive attention.

It has also been questioned whether the flint-knapper sought his material in its original site, that is to say in the beds where the process of its geological formation was completed, or if he used pebbles from the river drift. The prodigality of the specimens of these tools suggest that the source of the material was unimportant.¹ It is only later, when neolithic industry appears on the scene and flint-knapping has become a fine art, that implement-makers sought their material actually in the geological strata.

In the alluvium of Northern France, at Saint-Acheul as at Abbeville, the various types of this industry, Chellean, Acheulean and Moustierian (Fig. 9, No. 5) are sometimes found successively² in such a way as to indicate the predominance of the three types in different beds; nevertheless at the lowest of the levels known as Acheulean, Commont discovered in 1905 at Saint-Acheul a work-floor still in position, including a considerable heap of flint chips, a large number of nuclei, and various implements such as hammer and anvil stones, scrapers, planing-tools, arrow and spear heads, knives, and "coups de poing."

¹ H. Breuil, however (*in lit.* Jan. 10, 1923) is of the opinion that it is impossible to produce good implements from the Lower and Upper (Archæolithic) Palæolithic, using simple pebbles, and that we must admit that flint was really mined at this period.

² Cf. Commont, **III** (1905), 202 and **VIII** (1906), 228, (1907), 14.

Formerly the three "epochs" of the river drift were considered to be quite distinct, and characterized severally by industries shading from one into the other; but these dogmatic theories have already crumbled to dust in France,

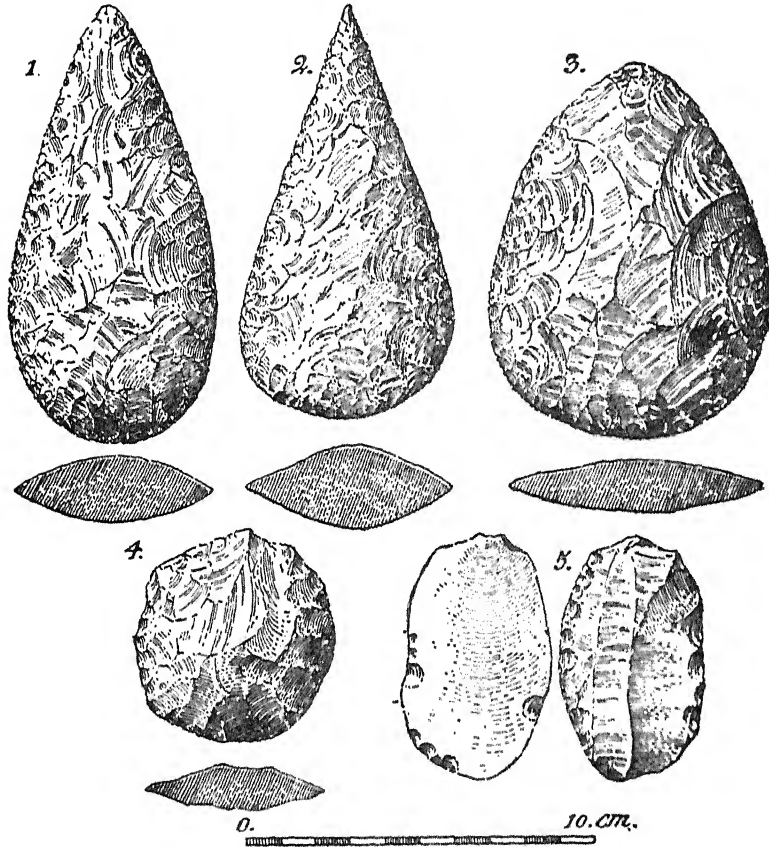


FIG. 9. Implements of Acheulean type.

and it is generally admitted that the Moustierian "period" of the southern provinces is contemporaneous with the Upper Acheulean of Picardy.¹

In the basin of the Garonne, where flint is absent and quartzite takes its place, the resultant industry is coarser; this industry is encountered in many other regions (Fig. 10)

¹ Obermaier, "Beiträge zur Kenntnis des Quartars in den Pyrenäen," XIII (1906), IV, 306.

and at first sight seems to be more archaic than those of the north, but the presence of *Elephas primigenius*, *Rhinoceros tichorhinus*, *Felis spelæa*, and other varieties, indicates both chronological concordance and the reverse.¹ In the Vienne Charentes districts, on the contrary, the materials lend themselves to working, and the implements of the same

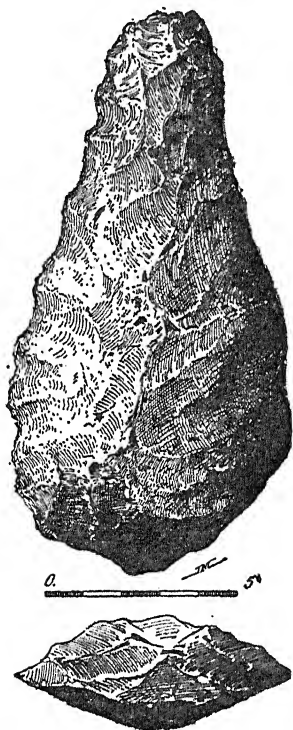


FIG. 10. Implements of Chellean type (Lake Karar, Algeria).

industries show a remarkable degree of skilled workmanship and regularity of contour.

As always, the river drift suggests doubts as to the relative age of these industries since they are only rarely represented with any degree of completeness and accompanied by palæontological evidence, and such remains may thus have been displaced from beds slightly older than the implements found therein. The station of Garret, in the commune of

¹ Cf. E. Cartailhac, **VI** (1894), 1; Obermaier, *op. cit.*, 305.

Villefranche (Rhône), presents a striking example of such mixed deposits.¹

In this respect the caverns offer greater security. In the cavern of la Micoque, in the commune of Tayac in the Dordogne, there is a bed of the greatest importance, which Chauvet and Rivière² began to explore methodically in 1896, and which has yielded the most valuable information on Acheulean industry in central France.

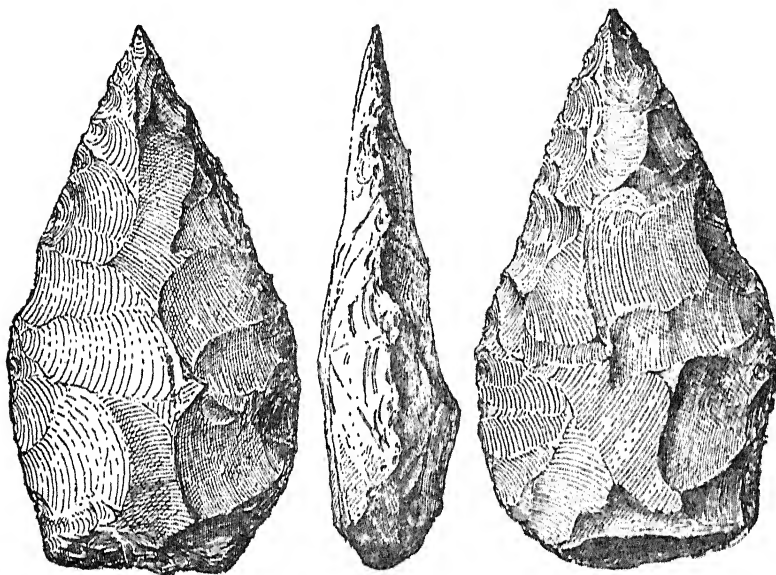


FIG. 11. Implements of Acheulean type (Tunis).

The upper layer of the bed is composed of a loose breccia yielding a great quantity of very fragmentary remains of one of the Equidae, in conjunction with chipped flints and Acheulean "coups de poing" which sometimes attain large dimensions and sometimes are extremely small (4 centimetres), and nearly always of delicate workmanship, together with chips, arrow-heads, scrapers and discs of the purest Moustierian type in much greater numbers.

Thus even in our own field of Western Europe, the classi-

¹ Cf. **XXVI**, 107.

² "Le Gisement quaternaire de la Micoque," **XIV**, Aug. 24, 1896; "La station quaternaire de la Micoque," **XIII**, Saint-Etienne (1897), 11, 697; L. Capitan, "La station acheuléenne de la Micoque," **VIII** (1896), 406; *id.*, **I** (1896), 527.

fication by "ages" of different cultures during the era of stone proposed in the early days of prehistoric study is gradually losing its value, even locally, whilst Quaternary Man is revealed to us as having had knowledge of all three types simultaneously, and as having made use of them in accordance with special needs determined by climatic and geographical conditions. It is this stage of civilization that we describe as *palæolithic*, a term to which we are far from attaching any general chronological value; and we exclude from the palæolithic the originators of contemporaneous industries of later glacial times—industries which, though highly particularized, nevertheless seem to be directly derived from those just mentioned.

In our part of the world palæolithic industry seems to have extended over a considerable period and during this time it certainly progressed and produced improvements in the manufacture of implements, but it is not possible for us to set up a rigid classification from the documentation available. The first prehistorians were too hasty in marking out divisions whose existence is no longer admitted.

But it is not only in the west of Europe that palæolithic industry flourished; it seems to have originated and developed in a number of different places. We say originated, because it is inadmissible to believe that it would have spread from a single centre to regions so distant one from another and separated by seas, deserts and high mountains.

Palæolithic implements of the Chellean and Acheulean type have been found in Quaternary alluvium, in caverns, and on the surface, alike in France, Belgium, the south of England, Spain, Algeria, Tunis (Fig. 11), Italy, South Germany, Hungary,¹ Egypt (Fig. 12), the Central African desert, the Cape of Good Hope, Syria, the Syro-Arabian desert, Palestine, India, Somaliland (Fig. 13), North America (Fig. 14)² and Mexico; they are still in use in Oceania among certain populations. Their presence is doubtful in Greece, Sicily, Malta and Siberia.³ They are absent in Scandinavia, Scotland, Ireland, the northern parts of England,

¹ These implements are much debated. Cf. Déchelette, *op. cit.*, 90, note 1.

² Only the bed of Trenton (New Jersey) [Th. Wilson, **XII** (1900), 149] is considered of the Quaternary epoch (Cf. **XL**, 596).

³ For the bibliography relative to all these countries, see **XXXVII**, 110 ff.



FIG. 12. Implement of Acheulean type (Upper Egypt).

Germany and Russia, in Switzerland and the Tyrol, in the Armenian, Iranian, Tibetan and Mongolian plateaux, in Chaldea and the northern part of South America, that is to say in all those countries which were either uninhabitable in Glacial times or had not emerged from the ocean. Thus this industry if not universal at least was very widespread—though undoubtedly at different periods—because it met an identical need and employed identical materials. Everywhere it pre-

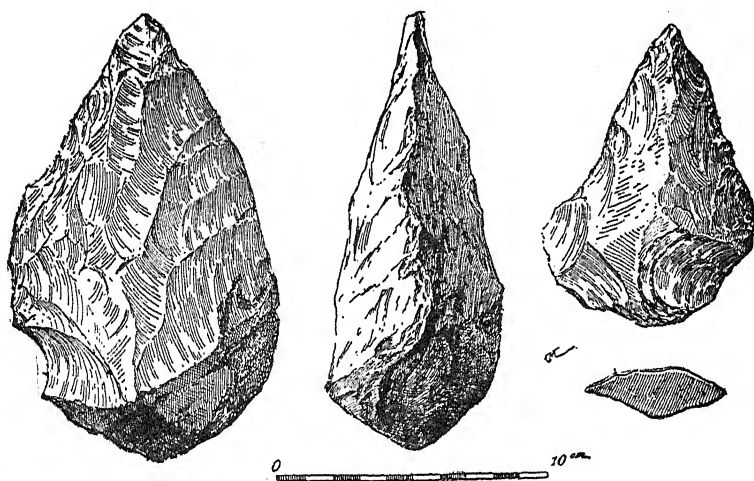


FIG. 13. Implements of Chellean and Acheulean type (Somaliland).

sented almost the same characteristics. The Grimaldi and la Micoque caverns and the open-air work-floors of Tunis,¹ Egypt and Somaliland² alike reveal to us that man at that time was familiar with fire, and that he lived by hunting and probably also by fishing. This is all that we have the right to affirm concerning these primitive populations.

The Moustierian Type.—The industry known as Moustierian, of which mention has been made a few pages further back (Fig. 15, Nos. 1 to 6), derives its name from the station of le Moustier,³ in the commune of Peyrac in the department of Dordogne, where there is a large cavern which was explored for the first time by Lartet and Christy in 1863.

¹ Cf. *ibid.* 112.

² Cf. H. O. Forbes, **XV** (January 1900), 11, Nos. 3 and 4.

³ For the bibliography, cf. **LIX**, 181, note 3.

We have seen above that the particular style of flint chipping known as Moustierian goes back, in France, to Chellean times, that is to say, it is contemporaneous with the earliest certain traces of Man that have come to light; nevertheless these implements seem to have been complementary to the use of Chellean or Acheulean "coups de poing." At le Moustier, and in a great many of the caverns of the Vézère, on the contrary, the use of the "coups de poing" becomes rare, and implements, formed from a large single flake chipped on one face only, predominate.

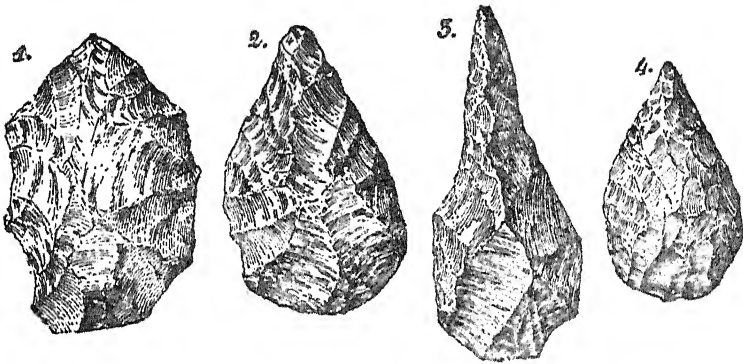


FIG. 14. Implements of Chellean and Acheulean type (North America).

The greatest development of the Moustierian type in our regions corresponds with a damp, cold climatic phase. We have already seen that during the period when the Acheulean "coup de poing" was the principal implement in use, the mean temperature had fallen considerably. As this gradual increase of cold continued, the fauna became modified, and the deposits of bone fragments in the cavern of la Madelaine, as of all other caves inhabited at that period, reveal the existence in that region of the Mammoth, *Rhinoceros tichorhinus*, *Ursus ferox* and *Cervus megaceros*, species characteristic of these times, together with the Lion, Hyæna, Leopard, Reindeer, Wolverine, blue Fox, musk Ox, wild Goat, Chamois and Marmot. Moreover, the transition from one fauna to the other was brought about gradually, keeping pace with the climatic changes which in turn brought about changes in the flora.

As for Man, like the Kamchadales of modern times described by Pallas, he sheltered in caverns and in hollows beneath rocks and also, undoubtedly, made for himself

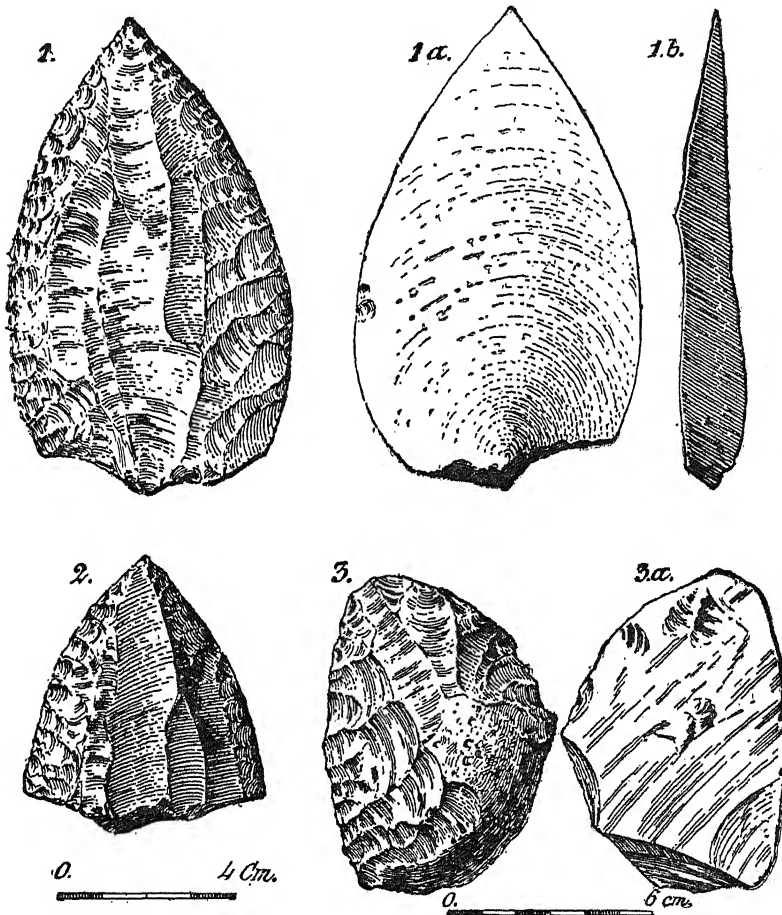


FIG. 15. Implements of Moustierian type (Le Moustier).

underground dwellings near streams in valleys lacking natural shelters, in the same manner as the Chukchi of Eastern Siberia. But, before these primitive men could occupy the caverns, they had to win them by force of arms from the wild beasts that had made them their dens. Frequently in the lowest "floor" of the siltage of such shelters,

we find remains of the animals which occupied them—bears, lions and hyænas—and which sometimes returned, either after having driven out their human occupants or when, for one reason or another, the cave had been abandoned. In the cavern of Echnoz-la-Moline, in Haute-Saône, no less than eight hundred skeletons of bears were found. According to Dupont¹ many of the Belgian caverns must have been occupied first by Hyæna, then by Bear, and finally by Man.

The principal implements among the equipment of the

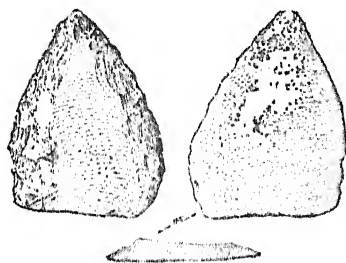


FIG. 16. A point of the Moustierian type. Yellow flint. (Oasis of Kharghiyeh, Egypt).

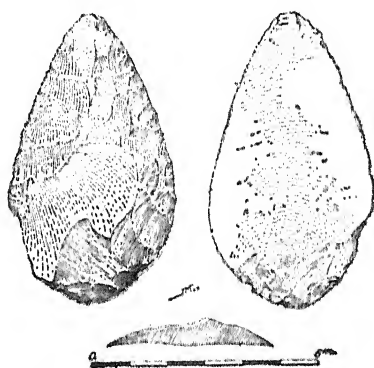


FIG. 17. A point of the Moustierian type. Flints with white patina. (Somaliland). Seton Karr Coll. Musée de Saint-Germain, No. 35524.

troglodytes of le Moustier are points (Fig. 15, Nos. 1 and 2) and scrapers (Fig. 15, Nos. 3 and 3a); the point is formed of a large flake in the shape of an elongated arch, chipped only on the two sides of the facet that has ridges corresponding to the removal of the preceding flakes from the nucleus. The scrapers are shaped on the same plan, but generally the chipping is on one edge only. Then come implements of varied forms, notched blades (Fig. 15, No. 6) carefully worked, but always on one face only; finally the skilfully amygdaloid "coup de poing" chipped on both faces.

The use of these various implements has been much discussed; but most of the explanations given are rather in

¹ XII, Brussels, 1872, 116.

the domain of imagination than of science, since we are completely ignorant of Man's customs at that time and are not able to affirm with any degree of certainty how they were employed. The people of le Moustier, like those of

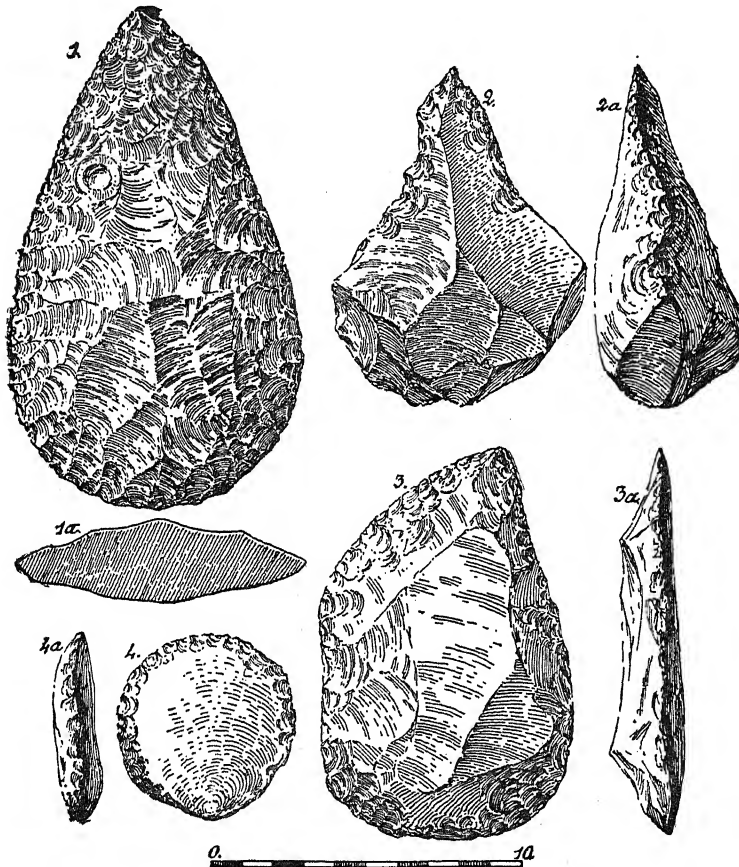


FIG. 18. Implements of the Quaternary type. River Penaar. (Central India.) Seton Karr Coll.

Mentone and Taubach, knew the use of fire. They do not seem to have made use of worked bone, or at least we do not possess any such instruments. At most we can point to a few phalanges of the Horse¹ and humeri of Bison, that

¹ Dr H. Martin, "Maillets ou enclumes en os de la Quina," *IV* (1906), 155 and 189; A. de Mortillet, "Les os utilisés de la période moustérienne. Station de la Quina." *Rev. préhist.* (1906), 231.

bear striæ that might have been cut by the hand of man. The people of the Moustier caverns cracked open their bones lengthwise in order to extract the marrow, but it would not seem that they made use of the splinters—at all events they did not carve them.

The Moustierian industry is to be met with all over France and even as far afield as Croatia, as well as in other regions such as Tunis, Egypt (Fig. 16), Syria, Somaliland

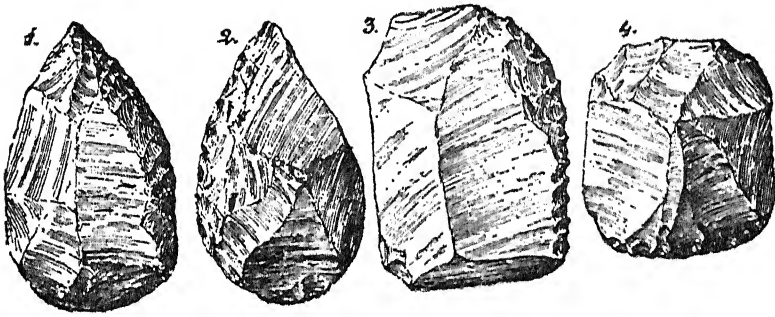


FIG. 19. Implements of Moustierian type (Trenton Abbot Coll. from sketches by Dr. L. Capitan).

(Fig. 17), India (Fig. 18), and the United States (Fig. 19); it is intimately associated with that known as Acheulean, and in the various stations the proportions of the two varieties are practically the same.¹

Such similarity in the forms of implements leads us to think that these industries were spread over the greater part of Western and Central Europe during the same periods; but we must not necessarily deduce from this that the different people who inhabited these lands were of the same blood. A few chipped stones are not sufficient to throw much light on such ethnical questions.

¹ Cf. Obermaier, **VI** (1905), 19.

CHAPTER II

ARCHÆOLITHIC INDUSTRIES IN EUROPE

DURING the period of greatest glacial extent, the northern continent constituted the main reservoir of the snows and the point of departure for glaciers. Its subsidence caused these vast masses of ice to melt, bringing about great floods, and at the same time a considerable lowering of the mean temperature in those regions in proximity to the old ice-fields. This period of cold, which in our part of the world was certainly of long duration, caused profound changes in both the fauna and flora and in the conditions of Man's existence. The floods certainly caused great destruction and considerable displacements of population; for, whilst the habitable area was increased in some directions by the retreat of the glaciers over wide regions, it was restricted in others because much of the land gradually disappeared beneath the water, in some places temporarily, in others for ever.

In many districts, such as Egypt, Somaliland, Mesopotamia and India, the population was driven out with the fauna with which it had lived; thus in these countries there was a long hiatus during whose course we find no trace of Man. This hiatus corresponds to the age of archæolithic industry. This evident depopulation in the regions just mentioned is less clear in Western Europe, where it only affects districts of small area. After this cataclysm life was preserved in "districts of survival" among men who had escaped extermination owing to the situation of their habitat or who had had time to flee from the danger. In those "districts of survival" new industries developed in accordance with the requirements of the new conditions. There is no doubt to-day that the Aurignacian culture, the first phase of this evolution in the west, developed out of the Moustierian. Then began the multiplication of human beings in these centres from which gradually the recon-

stitution of the population of the world was to come. Everywhere that we find remains of the beginnings of archæolithic industry we can regard the existence of such survival areas as certain; everywhere that a gap exists after the close of the palæolithic, we can be sure that that district remained uninhabited for a considerable time and was colonized anew by people from outside it, coming in either from survival areas or from distant lands.

This phase of culture in Europe, generally known as *The Reindeer Age* because of the prominence of this member of the deer family in the fauna of that time, to which Piette has given the name of the glyptic period, because certain districts yield such hard materials as bone, ivory, stone, and carved or incised reindeer horn, is sharply differentiated from the palæolithic by stratigraphy as well as by its own characteristic industries.

Dr Hamy, as early as 1870, in his *Précis de paléontologie humaine*, divided the late Quaternary into three successive epochs after the Moustierian, the oldest being the Aurignacian industry, followed by the Solutrean and Magdalenian—which last closes the series of what we call the archæolithic industries of Western Europe. This order is generally admitted to-day.¹

This phase of industry, which is well developed in France, demonstrates aptitudes hitherto unknown in the inhabitants: the arts begin, or, rather, we meet their first manifestations during this era.

The archæolithic and mesolithic flint industries present certain general characteristics. Implements are made of flakes chipped in a variety of ways; in this they differ from the palæolithic industry which utilized the core itself, chipping it on both faces, and chipped the flakes on one side only, that opposite the percussion convexity. The less ancient implements are very varied in shape, and much localized, some being of independent form, whereas others are obviously developed one from another by transformations.

¹ Breuil, *Essai sur la stratigraphie des dépôts de l'âge du renne*, *Congrès préhist. Fr.*, Périgueux (1905), 75; E. Cartailhac, *id.*, 83. A. de Mortillet (*XL*, last edition) and Al. Girod, *VIII* (1900), 309, perpetuating their error, still put the Aurignacian between the Solutrean and the Magdalenian.

According to our present knowledge, we see that in certain regions, such as Western Europe, there were numerous transition forms between the Chelleo-Moustierian type and that of the polished stone industry, whereas other localities possess only a few, and in certain countries we seem to pass directly from the palæolithic industry to neolithic culture, perhaps even to that of metal, without meeting the slightest trace of any archæolithic or mesolithic phase whatsoever. This is the case in Egypt, while Italy seems to have passed directly from an archæolithic type to the Campignian industry without having known the Solutrean and Magdalenian forms.

In North America the industries are partly of the Acheulean and partly of the polished stone type; we meet at the same time implements belonging to all the European types, from the Moustierian to that of the Danish kitchen middens; and to a large extent these tools, or at least these shapes, were still in use among the Indians many years after the colonization of the coasts by Europeans.

In order to obtain an idea of what were the conditions of human existence during the period which produced in France these various archæolithic industries, we must turn to the phenomena that have taken place since the disappearance of the great glaciers, and consider in what state the snow had left the soil.

In their retreat the glaciers gradually abandoned vast territories, at first unproductive, although soaked with moisture, cut up in every direction by streams and covered with quagmires, marshes, lakes, and islands of melting ice. The grass zone gradually extended over these areas. On the level land it formed immense prairies of which wild animals took possession, followed by the human beings who hunted them, either making their homes there or penetrating only on hunting expeditions in favourable seasons. In the rear of these steppes forests advanced, gaining on them progressively, and following from a considerable distance the line of glacial movement, thus presenting the characteristic appearance of cold countries. This earliest forest zone, of varying depth, itself was replaced in turn, at a point still further

back, by the coppices of more temperate climes having frequent clearings, with swamps in the low-lying ground, and pastures on the uplands. The flora and fauna showed every variety intermediate between the glacial zones and really hot countries.

It must not be forgotten that the melting of vast masses of ice, absorbing an enormous amount of heat, produced an intense lowering of the temperature in their neighbourhood ;¹ this cold chiefly influenced the steppes lying nearer than the forest zone to the glaciers. Under such conditions the climatic variations between different parts of France were much greater than they are to-day, and the mean temperature was colder. Reindeer multiplied rapidly, herds of Horses ranged over the steppes of our northern and central districts in company with the Bison, still numerous in North America during recent centuries. The forests supplied the Mammoths not only with food but with the mysterious retreats those pachyderms affected. Goats followed the retreating snow into the mountains. It was in this complex and infinitely varied environment that the development took place, in Western and Central Europe, of the archæolithic industries of the survivors of the disasters accompanying and following the disappearance of the glaciers. In those regions nearer the tropics, however, the conditions of life were different.

During recent years, thanks to the labour of a group of conscientious observers, discovery has borne its fruit. To the very natural confusion of the early days rational classifications have succeeded, relative dates have become certain, and the distribution and extent of industries has become clear.

Some, widely diffused, extend throughout all those districts separating Spain from the North Sea ; others are more limited. Man has become better armed against the varied difficulties with which nature confronts him, and perhaps these difficulties themselves have become less troublesome than in the past. Population is much sparser, however, and for a long period wide stretches of the earth will be left untenanted.

¹ In northern seas, according to some authors, the proximity of an iceberg can be recognized, at night, by the rapid fall of the thermometer.

THE AURIGNACIAN INDUSTRY

Flint Implements (Fig. 20).— Points and scrapers of the Mousterian type abound in Aurignacian strata, but we find also a good many forms hitherto unused, among others planing tools chipped from very thick flakes, sometimes even from blocks having the appearance of nuclei; this new method of manufacture was undoubtedly adopted to give the tool greater resistance to fracture; hence it must have been intended for use on relatively hard materials. Then come blades with a single or double notch, others chipped on one

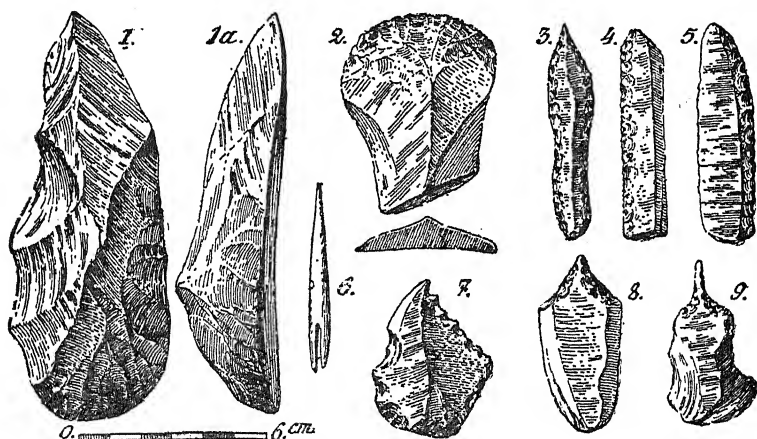


FIG. 20.¹ Aurignacian Industry. Principal types of chipped flints.

side alone, thus forming knives with backs; more or less finely pointed drills, curved and angular graving tools intended for work in tough materials such as stone, ivory, bone, horn, hard wood, etc. All these forms are new and some will persist up till the appearance of metal.

Bone Implements—The Aurignacian bone tools are hastily and coarsely worked. They consist of points, some of them split open at the base; coarse pins or awls with a head; polishers and bones with deep incisions. But we do not know to what use these various objects were put.

With the above industry appear Man's first tentative artistic efforts, or at least the earliest of which we yet have

¹ Fig. 20, No. 6, is not to be confused with the Magdalenian forked point.

knowledge. They consist in attempts at graving on soft rocks, and in naïve sculptures in high relief—figurines for the most part representing women in the nude. We shall return to this subject when dealing with art in Quaternary times, but we mention them in this connection because these engravings and sculptures explain the existence of the short gravers and very thick planing tools indispensable for working hard materials.

Together with the remains of the Aurignacian industry are found the bones of all those animals which Man then used for food, and the bones and teeth of which he employed in the manufacture of the implements necessary to his life, and the pelts for clothing, since the times were cold. These animals were: *Elephas primigenius*, *Rhinoceros tichorhinus*, *Ursus spelæus*, *Felis spelæa*, *Hyæna spelæa*, *Equus caballus*, *Bison prisus*, *Cervus megaceros* (of Ireland), Reindeer in great numbers, wild Goat (*Capra ibex*), Roe-deer (*Cervus capreolus*), a Bear and a Hyæna of unnamed species.

Game certainly abounded, but often its capture was a difficult matter, and the carnivores particularly were formidable. How were these men, armed only with the implements known to us, enabled to match themselves against such powerful beasts? The little flint points of the Moustierian type were incapable of bringing down a mammoth or a bison. Obviously they had more powerful weapons, made of materials which have disintegrated, such as wood or horn; probably they also employed snares, traps and pits similar to those still in use in Indo-China for trapping tigers—pits furnished with sharpened bamboo stakes implanted in the ground, on which the animal impales itself in its fall.

This observation with regard to the insufficiency of Aurignacian Man's stone weapons applies equally to every phase of Quaternary culture, as well as to many groups of uncivilized men in our own times; but in our era these primitive men increase the efficacy of their arrows and pikes by smearing the points with poison; perhaps men did the same in long-past ages.

Dyeing.—We possess no other proofs of this custom than the presence of mineral colours in the Aurignacian layers of the caverns. In the station of Roches (Indre) Septier discovered seventeen specimens of colouring material, among

them a blood-coloured plaque, some red or wine-lees coloured clayey earths, sandstones containing oxide of iron, red and yellow ochre, and fragments of pyrolusite and oxide of manganese.¹ Iron ore and manganese ore have been discovered in the Grotte des Fées,² and in the Aurignacian Caverne des Cottés (Vienne) a carved reindeer cannon-bone has been found containing ochre.³

For what were these colours used? Were they for dyeing the skins of which the Aurignacians made their clothes, or for tattooing the body, a practice still in use among numerous savage tribes, in vogue in prehistoric Egypt, and even among the Ligures and Gauls? We are persuaded to believe that these people covered their bodies with painted designs, when we remember certain objects discovered in the floor levels of this epoch at Crot-du-Charnier (Solutré): rude articles of adornment in bone and ivory are found associated with fragments of colouring matter and plaquettes of schist, which, as in the Valley of the Nile, probably served as palettes for crushing and mixing the colours with oil, fat or water.

THE SOLUTREAN INDUSTRY

Sections made at the Crot-du-Charnier, at Solutré (Saône-et-Loire),⁴ permit no doubt as to the priority of the Aurignacian industry over that of the Solutreans, the first of these two industries being represented at the bottom by two separate floor levels, each covered by a layer of rock detritus. It is on top of the last of these sterile layers that the Solutrean floors are found, accompanied by a fauna differing completely from that of the lower levels. We find the Wolf and the Fox, *Hyæna spelæa*, *Ursus spelæus* and *U. arctos*, *Meles taxus*, *Mustella pustorius*, *Lepus timidus*, *Elephas primigenius*, *Equus caballus*, *Cervus tarandus*, *Cervus canadensis*, *Bos primigenius*, wading Birds and Birds of prey, etc., of unnamed species.⁵

. . . In the layers lying between the floors of the two industries is one composed entirely of the bones of Equidae,

¹ IX (1904), 265.

² V (1869), 387.

³ Breuil, VIII (1906), 53.

⁴ Cf. Arcelin, *Bull. Sc. nat. Saône-et-Loire*, November-December 1901.

⁵ XXVI, 134.

giving rise to the idea that the Solutreans had domesticated the Horse; but this opinion has been abandoned.¹

Flint implements (Fig. 21).—These implements as a whole are remarkable for their fine technique, and are of two different sorts, each manufactured from rather large flakes chipped with great skill. Some are chipped only on one face, points, planing tools, drills, saws, etc., analogous to those of the Moustierian and Aurignacian industries; others, fashioned on both sides but rather slender, are heads of javelins, hunting spears, and daggers(?); all are of the lanceolate form of a willow or laurel leaf; occasionally they are rounded at one extremity while the other remains sharp.

It is nothing less than a genuine revolution in stone working which becomes apparent in the Solutrean industry, and this lanceolate type of point will be found in every age and in every country, at different epochs. During the Neolithic it is seen in Scandinavia, Egypt, Tunis, Central Africa, Susiana, Mexico, and the United States, either in the form of arrow-heads or in examples large enough to serve as heads for lances or javelins; they are known in flint, quartz, flint-like feldspar, obsidian, etc.; but notched and tanged arrow-heads are also to be found. The various tools of the Aurignacians persist in Solutrean times, sometimes even more completely than in the former industry; we find the double scraper and the single or double drills—in short nearly all the forms that flints can take in the hands of skilled workers.

Bone Implements.—A series of very fine bone needles pierced with an eye and of delicate workmanship was recovered from a floor layer in which these sewing implements were found in company with notched arrow-heads, incised reindeer-horn implements, shells, and animals' teeth with holes for stringing. The Solutreans occupied themselves with works of art, and engraved animal figures on their palettes of reindeer horn.

Geographical Distribution.—The Solutrean industry, however, is limited to one district of our part of the world and presents a somewhat local interest. It is almost completely absent in the north of France; but traces of it exist in

¹ LIX, 204.

Belgium, the British Isles, on the Rhine, and in Bavaria. It seems to be developed especially between the central

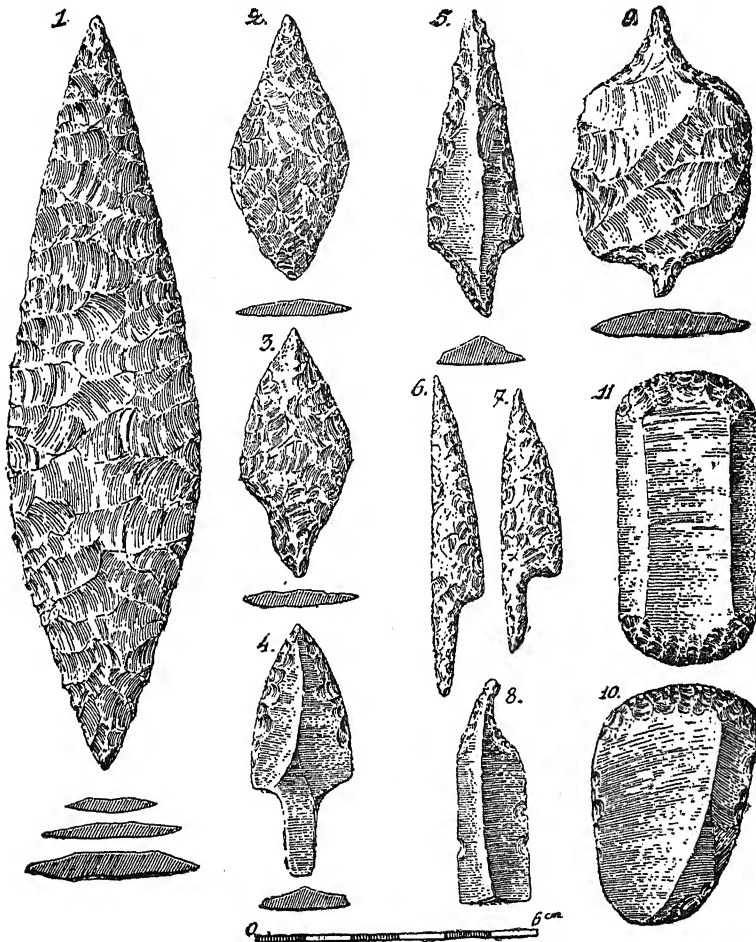


FIG. 21.¹ Solutrean Industry. Principal types of chipped flints.

Massif and the Jura on one hand, and on the other towards the Pyrenees and Catalonia in Spain.

Nevertheless certain discoveries made at Predmost (Moravia) and in the caverns in the neighbourhood of Ojców (Russian Poland),² in Württemberg and in Hungary,

¹ Fig. 21, Nos. 4 and 5 appear also and especially in the Upper Aurignacian.

² Cf. **LXIX**, 143 and 174.

appear to be Solutrean. It is possible that the form is analogous; but, owing to the distance of these stations from the Solutrean area, limited even in France, it is difficult to admit the identity and the synchronism proposed by the Germans.

This industry, certainly imposed on the people by the fauna and the climate of a certain district of France, seems to be peculiar to that country. A few of these forms have been in use in other regions, such as the notched and tanged arrow-heads, the double scraper, and the laurel-leaf point, for example. But these analogies should only be taken into consideration to furnish one more proof that analogous needs bring about the production of similar implements: the presence of points of the Solutrean (thick) type in the Lower Palæolithic of Egypt and Algeria is a case in point.

MAGDALENIAN INDUSTRY

The industry known as the Magdalenian, from the name of the cave of la Madelaine in the commune of Tursac (Dordogne), constitutes, in France, the last phase of the Reindeer Age and the final evidence of the life of Pleistocene Man; it is the last of the cultures designated archæolithic.

At that epoch the climate of Western Europe was still very cold, and it is likely that the seaward boundaries of the continents were not what they are to day, but that there were still some extensive stretches of land intercepting those ocean currents which now render our part of the world temperate. The climate of France was then continental. The proof of this lies in the fact that our country sustained an arctic fauna:—Saiga, Canadian Deer, Musk Ox, Lemming, Blue Fox, Grey Bear, and that characteristic animal of the north, the Reindeer. Nevertheless, the last of the mammoths and rhinoceroses, probably cut off in their migration toward the south, still lived in our forests; their presence, moreover, should not surprise us, for, in spite of the oncoming of intense cold, they continued to inhabit Siberia, and the Liakhov Islands, further north, for a long while.

Man continued to live in caverns and also, no doubt, in underground shelters which he constructed himself. He

retained his hunting and fishing habits, and lived on game and fish; but the experience of many preceding generations taught him to make numerous improvements in the method of using for weapons such hard animal materials as bone and ivory; probably he also employed to better advantage than his predecessors wood, horn, and other materials at his disposal which have not resisted the ravages of time. The Solutreans seem to have made the very most that could be made of chipped flints; after their day it was to ivory and bone that the Magdalenians turned their attention, and though they retained most of the forms used by their predecessors (always excepting the laurel-leaf point and the notched arrow-head) they created a great many new implements of bone and ivory, which, to a large extent, we still find in use among the primitive peoples of our own times.

Flint Implements (Fig. 22).—The great importance attached by the Magdalenians to work in ivory, bone, deer and reindeer horn, constrained them to manufacture a whole series of flint implements especially designed for this work; also a number of forms hitherto unknown appear. These are blades chipped at the sides and provided with a tang, no doubt for hafting; straight and oblique scrapers, blades with multiple notches which may have served as saws; awls and gravers, sometimes very finely made; and, finally, hybrid types of scraper-gravers. There are even some among these instruments so fine that it has been supposed that they were designed to pierce the eyes of bone needles or to prick the skin for tattooing; but along with these special forms are found single or double scrapers, and plain or chipped blades, very skilfully flaked from the nuclei, in great abundance; also blades of all sizes, from those of a few millimetres in breadth to long knives of some twenty centimetres in length, all of them in countless numbers in the caverns.

Implements of bone, ivory, and reindeer and deer horn (Fig. 23).—We shall consider these implements from the point of view of their use only; all are more or less ornamented, and their artistic character will be dealt with in the chapter specially devoted to the arts.

The characteristic implements of the Magdalenian industry

are the harpoon and the spear-head, these weapons being made always of ivory, reindeer horn or bone.

The spear-head is a simple stem, round or elliptical in section, tapering very much at the point and either thickening or diminishing at the base, according to whether the hafting is accomplished by binding it on to the end of the shaft, or

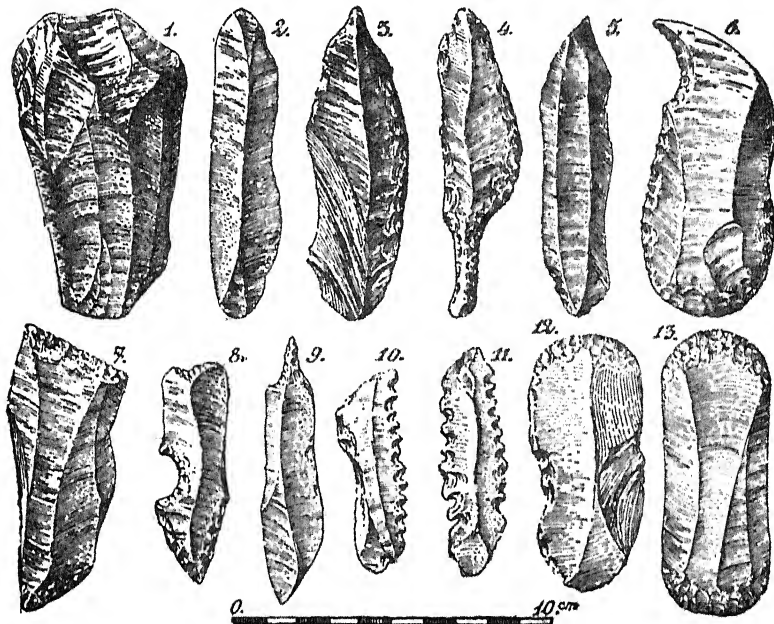


FIG. 22. Magdalenian Industry (principal types of chipped flints).

by implanting it in a wooden shaft previously bored for it. In both cases it was necessary to make a strong ligature round this hafting with specially prepared sinews. Modern primitive peoples make great use of this kind of weapon, and in our ethnographic museums we have complete panoplies.

The small points served as arrow-heads; for, no doubt, the Magdalenians, so advanced in regard to their implements, and familiar with the throwing-stick still used by the Australians, the Chukchi and the Esquimaux,¹ were not ignorant of the use of the bow; even the Solutreans may have been archers.

The Magdalenian harpoon is a long point, round in

¹ The Pre-Columbian Mexicans and Peruvians used the throwing-stick.

section, provided with barbs, often multiple, arranged sometimes on one side only but frequently on both. In this case the barbs alternate on right and left, at equal distances one from the other.

Among these harpoons there are some very small ones

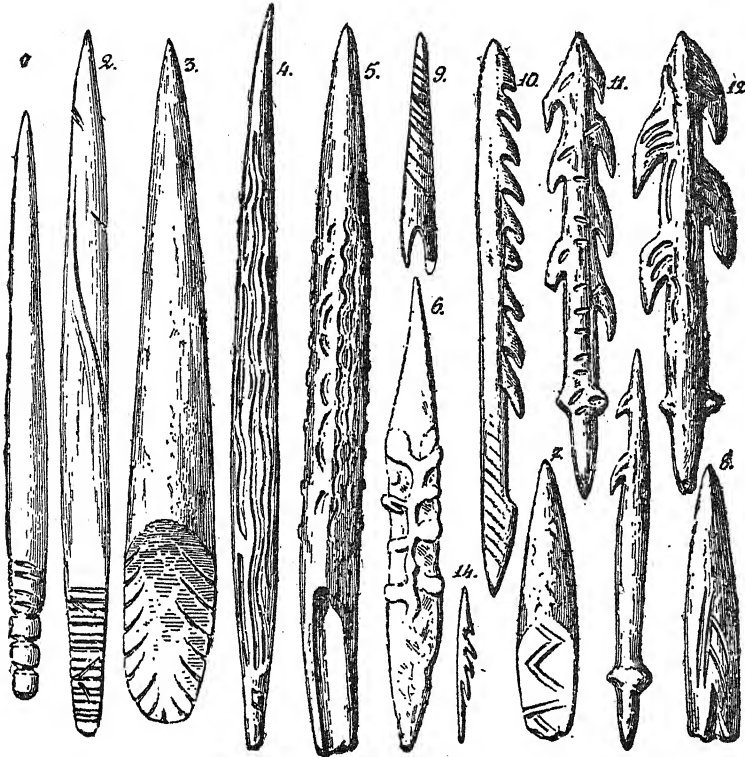


FIG. 23. Magdalenian Industry (implements of bone and ivory).

which probably were used on arrows ; they are made on the same model.

At the base of these instruments two protruding points provide for a secure fastening to the shafts, and when the head is intended to separate from the shaft, serve as a notch to which the floating line can be attached.

As for the throwing-sticks, the Mas d'Azil cave (Ariège), the station of Bruniquel (Tarn-et-Garonne), and many other localities have furnished us complete or fragmentary specimens. These are cylindrical sticks provided with a stop-

notch, similar in every way to modern throwing-sticks, but generally ornamented with carvings, representing animals, that are often most remarkable.

In the Magdalenian caves there are found also peculiar implements whose use is not known and which have been called "*bâtons de commandement*." These are pieces of reindeer antler cut slightly above and slightly below the beginning of a branch-antler, pierced with large circular holes and frequently ornamented with engravings representing animals, or with more or less regular lines. These have been found as early as the Solutrean epoch; but it is in the Magdalenian that they are most frequent.

Every possible explanation of the use of these curious implements has been suggested; the most probable is that which allocates to them a magical or religious rôle.¹

To this already long list of implements of bone, ivory and reindeer horn must be added needles, remarkable for their construction, and especially for the skill with which the eye has been pierced; pins with or without a head, spatulas, polishers, bones tapered by polishing, and implements of undefinable shape, the use of which remains unknown.

When we see how skilful the Magdalenians had become in bonework, and with what care they polished these implements, we are surprised at discovering that they never attempted to polish stone. The delicacy and precision of this bone cutting took the place of edges produced by friction, and as their principal weapons were of bone and ivory, they did not feel the need of replacing these edges by more perishable implements of flint.

Ceramics.—None of our Magdalenian stations have furnished pottery; but eminently trustworthy Belgian prehistorians maintain that the contemporaneous stations of the valleys of the Meuse and the Lesse have yielded a very primitive, yet clearly characterised pottery.² This pottery was hand-made from a coarse clay and badly baked. No complete vases have been recovered but only fragments which would appear to have belonged to large, open, flat-bottomed bowls.³

¹ Cf. **XLVIII**, I, 80.

² Cf. Julien Fraipont, "*La poterie en Belgique à l'âge du mammouth*," in **VII** (1887).

³ **XXVI**, I, 171.

We know that many tribes of our own times, of primitive culture, have no knowledge of pottery; and that, more especially among the nomads, earthen pots are excluded from their equipment on account of their fragility; the more advanced replace them by utensils of metal, the more barbaric by receptacles of leather or wood. This is probably what took place among the Magdalenian troglodytes of our regions. We sometimes find in the caverns, however, flint geodes of various sizes, and these are occasionally further scooped out by rough working; we also find pebbles hollowed into the form of a mortar,¹ sometimes provided with a sort of handle. These cupped stones have been compared with analogous objects used by the savages of South America to procure fire by means of a dry and inflammable piece of wood which is rapidly twirled in these naturally rugose cavities.² Hence the existence of pottery in a given station does not definitely indicate the nature and epoch of the industry of that site.

Distribution of the Magdalenian Industry.—This industry seems to have occupied a considerable area in the west of Europe; we meet it almost all over France; in the south and centre of England; in Belgium; central Germany; Austria; Hungary; Poland, and as far afield as Russia. In the south, in the Mediterranean countries, we as yet know it only in northern Spain, but it appears in the caverns of the Syrian coast. It thus extends, except as regards Syria, over regions which in those days enjoyed a more or less similar climate, and possessed almost the same flora and fauna. The presence in the Magdalenian layers of ornaments of ocean shells and shells from the Mediterranean suggest that at that period commercial relations were already being gradually extended, thus leading to the deduction that, starting in one locality, the Magdalenian forms of industry spread widely. This explanation is certainly satisfactory, because the area recognized as Magdalenian is not of exaggerated extent and hence the Magdalenian culture-forms, created for special conditions, would not have left their place of origin. The existence, however, of any single centre for that origin is far from proven, since it is quite possible that

¹ L and XIII, pl. XXII, 110.

² L, I, 249.

the greater part of these forms, determined by new conditions of life, might have appeared at the same time in many different localities among tribes widely divergent from the ethnic point of view. Our documentation regarding the eastern districts of Russia, Poland, Hungary, and Syria is still too incomplete to authorize us to unify all industries of a general Magdalenian aspect or to consider them as contemporaneous; we are even ignorant if there was an exact synchronism between the climatic conditions of the Occident and Orient in the Reindeer Age; or if this animal retreated toward the north when it left our regions or the steppes of Russia. The presence in these days of the Aurochs in the forests of Lithuania, and its existence in Germany in the times of Cæsar and Tacitus, when it had disappeared from Gaul, would seem to indicate that the migration of these animals was at first from the west eastwards across Central Europe, following the climatic changes; then from the south northwards, working up from the Russian plains to Lapland and the coasts of the Arctic Ocean. In that case the industry appropriate to the conditions of the life of the reindeer would have followed, and there would be no synchronism for the various stations beyond the Alps. Moreover, thousands of years after the extinction of the Magdalenian culture in our land, many northern tribes still practise these industries, and one can hardly deny that such inventions, meeting special needs, are born wherever those needs make themselves felt (Fig. 24).

The Magdalenian industry, even in the Occident, is far from homogeneous; in the numerous stations where its remains are found the implements vary in detail, as also in development of artistic taste; such variations are due either to local conditions, or to the different phases of this culture as exemplified at different stations; but as a result of the nature of the researches undertaken, and the methods employed, together with the mental tendencies of the researchers, these various evidences of Magdalenian life have received different names, all more or less justified in themselves, but each being considered, quite erroneously in our opinion, as corresponding to special ages. Thus we see such classifications as the *Eburnian*, *Glyptic*, *Gourdanian*, *Tarandian*, *Lortetian*, *Elaphotarandian*, *Hippician*, *Equidian*

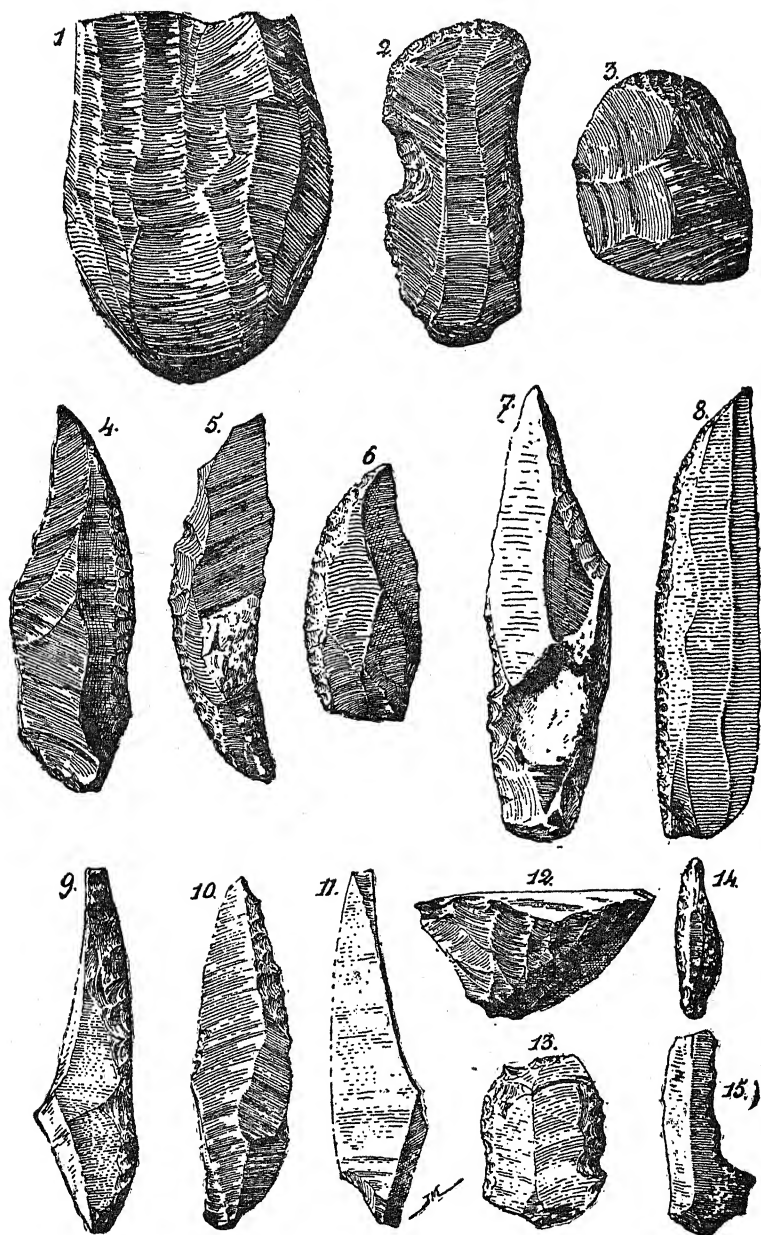
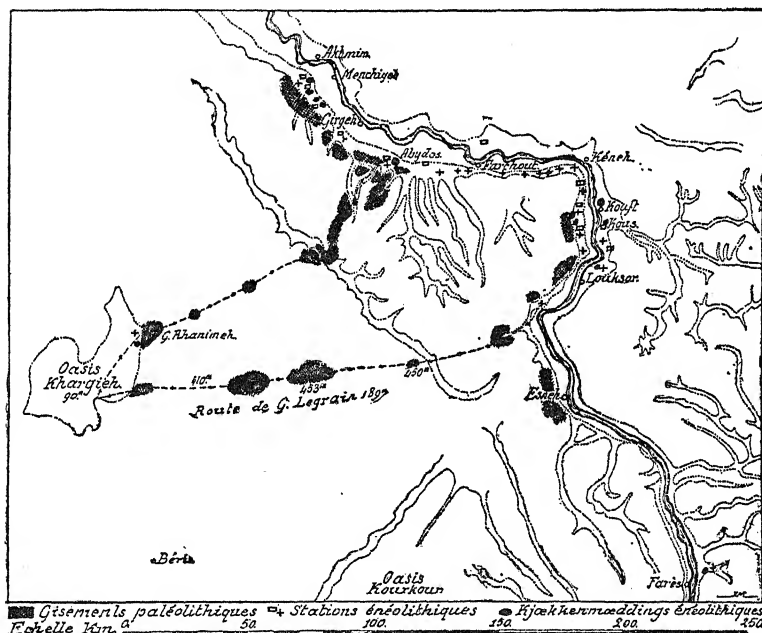


FIG. 24. Chipped flints of the Capsian industry : 1 to 8, El Mekta (Tunis) ; 9 to 15, Foum el Maza (Tunis).

Pliocene. Upper.	Alluvia of the plateaux. Moraines of the first great glacial extension.	<i>Elephas meridionalis</i> , <i>Rhinoceros etruscus</i> , <i>Equus stenonis</i> , etc. TEMPERATE CLIMATE.	Eolithie industry (?)	
Pleistocene. Lower.	Transitional layers of the Forest-bed of Saint-Prest de Solihac. Moraines of the second great glacial period.	<i>Elephas antiquus</i> , <i>Rhinoceros merki</i> , <i>Hippopotamus</i> . COLD, DAMP CLIMATE.		Chellean type predominating.
Middle.	Alluvia of the middle terraces, calcareous tufa. Moraines of the third great glacial epoch.	Epoch of the <i>Hippopotamus</i> . MILD CLIMATE.	Palæolithic industry.	
	Moraines of the third great glacial epoch.	<i>Mammoth</i> , <i>Rhinoceros tichorhinus</i> , <i>Beur</i> , <i>Hyæna</i> , etc. DAMP, COLD CLIMATE.		Acheulean type predominating.
Upper.	Débris of the Caverns, loess, and alluvia of the lower levels and terraces. Higher floors of the caverns. The upper loess.	Epoch of the <i>Mammoth</i> . Epoch of the <i>Reindeer</i> fauna of the steppes. COLD, DRY CLIMATE.	Archæolithic industry. Mesolithic industry.	
	Transitional strata.	<i>Cervus elaphus</i> , <i>Castor</i> .		Neolithic industry : Metals.
Modern	Recent alluvia. Peat.	Modern species and domestic animals. CLIMATE APPROXIMATING TO THAT OF TO-DAY.		

and *Elaphian* industries, to which it has been attempted, without justification, to assign a chronological value; such assignments usually having a merely local value, showing how the researchers, brought into contact with reality, all have a tendency to divide these industries according to place and climate, and to give a very great importance to prehistoric regionalism despite theories of generalization.



Gisement paléolithiques = Paleolithic Deposits. Stations énéolithiques = Eneolithic Stations. Kjœkenmoeddings énéolithiques = Eneolithic Kitchen Middens.

FIG. 25. Prehistoric stations in the desert between the Nile Valley and the Oases. (From a sketch-plan by G. Legrain in 1897).

After having set forth all that is known of those industries, which in our part of the world were developed in Quaternary times, it may be useful to sum up in tabular form the more important facts relating to the life of Man, to the climate, and to the accompanying fauna. We borrow the main features of this table from Marcellin Boule.¹

We cannot insist too much on the fact that this table is applicable only to the western countries of Europe, both in

¹ M. Boule, VI (1906), 261; Déchelette, *op. cit.*, 46.

regard to the glacial phenomena, the climates which it indicates and the resulting types of fauna and industry ; many regions never experienced the effects of the glacial period ; others have only been affected by it to the extent of a recrudescence of the humidity of the atmosphere, resulting in modifications in their fauna entirely different from those which have taken place in our northern latitudes, and hence in these areas a completely different course has been followed by the life of Man. Thus the inhabitants of Egypt seem to have passed directly from the palæolithic industry to neolithic, perhaps even to eneolithic, and the same seems to be true of Mesopotamia. None the less we dare not deny absolutely the existence of archæolithic industries in some localities of these oriental countries merely because we have not yet met traces of it. It is certain that after the great Quaternary inundations these regions remained desert for a long while ; the sudden appearance of eneolithic industry in the valley of the Nile and in Chaldea supports this hypothesis. In the Egyptian (Fig. 25), Arabian and Syrian deserts, palæolithic implements are extremely numerous. The population at that time was relatively very dense in these countries ; then, as we have seen, there was a hiatus covering all those developments of culture that in Western Europe correspond to archæolithic and mesolithic industries. It might be claimed that this gap is merely apparent and that it is due only to the insufficiency of our researches. Taking into consideration the great areas in which no form of implement is found that could be attributed to archæologic industries, I am unable to agree with this view.

CHAPTER III

THE MESOLITHIC INDUSTRIES

PALÆ-ETHNOLOGISTS are accustomed to include in the neolithic industrial phase cultures differing greatly from those we have just been considering, and, in their opinion, transitional between the chipped stone industries and polished stone tools. On the one hand we find among the equipment of these groups many implements common to them and the Magdalenians, whilst, on the other, new forms appear which do not include those of polished stone. In 1909¹ I proposed for these intermediate industries the name of Mesolithic.

"In reality," says J. Déchelette in his *Manuel*,² "the ancient technique, that of chipping flint, persisted parallel with the new processes. Several types of tools, ordinary blades, notched blades, scrapers, drills, etc., fundamental forms of the flint tools of all times and latitudes, remain in use, though sometimes undergoing slight modifications. New tools likewise chipped by percussion or by pressure appear alongside the ancient types."

In our part of the world, at that time, the conditions of life had been modified; to the dry cold of Magdalenian times had succeeded at first a damp, temperate climate, and the glaciers came gradually to be limited to the regions they occupy to-day. The present fauna became established, the Reindeer withdrew into northern regions, and the pachyderms disappeared, although they had survived the intense cold of later Quaternary times and although the conditions in Gaul had become more favourable for them than in the past.

This disappearance, coincident with a neglect of art, which had been so highly developed among the Magdalenians, suggests that in spite of the reasoning and conclusions of most prehistorians,³ there exists a gap in our knowledge, a hiatus whose existence cannot be denied.⁴ The phenomena

¹ XXXVII, 136 ff.

³ Cf. XXVI, I, 310; LIX, 266-282.

² I, 308.

⁴ Cf. LV, 247.

which took place at that time and which caused this hiatus were certainly of a natural order, otherwise the Mammoth, the Bison, and many other animals besides would not have become suddenly extinct. As for the disappearance of the arts, it is complete, or at all events those timid attempts of the early days of mesolithic and neolithic industries are certainly not a degeneration of the art of the caves, for they do not appear to be inspired by the same spirit.

From the outset of mesolithic industry a greater variety of culture is evident than in Quaternary times. Special needs corresponded with differing climatic regions, and since the human mind is receptive of new ideas, more intimate groupings than of old, and a great development of local tastes and tendencies resulted. As for the migrations to which formerly perhaps too much importance was given, but which to-day seem to be too much denied, they have certainly played a great part in the transformation of the civilizations of Western Europe. It is difficult to explain otherwise how the Magdalenian tribes, remaining in the land of their origin, dwindled to the point of leaving nothing of their civilization, at the very moment when the conditions of their existence became most favourable. Whatever was the cause of it, the caverns are almost all abandoned at this epoch, although they always offered excellent shelters. Without doubt these sudden transformations in the life of Man were the result of profound causes, and everything leads us to believe that they are due to the intervention of peoples newly come into our part of Europe.

It must not be forgotten that Siberia, which from the beginning of the glacial era was without communication with Europe, separated as it had been from Europe by the glaciers of the Russian steppes and the Aralo-Caspian lake, had just had the way opened up to the old world, and that hordes, driven from their country of origin by the cold, started to come in successive waves and to flood Europe, Iran and India in search of greater ease of life. These migrations from East to West began very early and continued almost up to our days, flood after flood appearing almost ceaselessly. In these movements we must seek the cause of the confusion which we recognize in the succession of western industries; and also that of the appearance of brachycephalic people and of

the languages of the Aryan group. Thus a great revolution took place at this period.

Azilian Industry—Among the rare discoveries which throw light on the beginnings of mesolithic industries, those of Piette in the cave of the Mas d'Azil (Ariège)¹ are of first importance.

Lying above two layers clearly characteristic of the Magdalenian industry, and separated from these floors by a stratum of yellow river-ooze, were found the remains of a

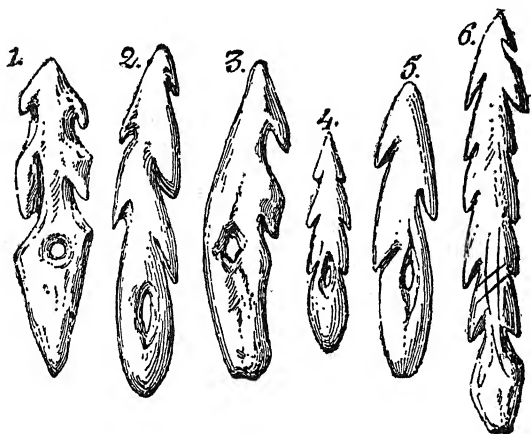


FIG. 26. Harpoons of bone and stag-antler, 1-3, Maz d'Azil. 2-4, Cave of Tourasse (Haute-Garonne). 5-6, Cave of Reilhac (Lot)

culture to which Piette gave the name of the *Azilian Epoch*. Here were found hearths, heaps of peroxide of iron, numerous bones of deer—but none of reindeer—chipped flints of the Magdalenian type in great abundance, little rounded side-scrapers, knife-blade implements, flat and perforated harpoons of stag-antler, bone stiletos and polishers, and broken bones giving evidence of the presence in this region of the common Stag, Roe-deer, Bear, wild Boar, Beaver, Badger, wild Cat, etc. Piette came across numerous pebbles of schist bearing marks traced in red ochre. This, though astonishing, is confirmed by similar discoveries in other caves, such as in those at Cousade² near Narbonne, and Tourasse.³

¹ Piette, **XIII**, Pau, 1892, II, 649; *id.*, **I** (1895), 235; *id.*, **VI** (1895), 276; *id.* (1896), 386. The Piette collections are now in the Musée de Saint-Germain.

² **I** (1895), 262.

³ According to Abbé Breuil. Cf. **XXVI**, I, 319.

In this same layer were two skeletons, of which we shall speak later in connection with funeral customs.

Above the Azilian layer the explorer found a last archaeological level containing, among other implements, tools of polished stone. Thus the Azilian industry is intermediate between that of the Magdalenians and neolithic culture.

It is not only in the Mas d'Azil that we find the remains of this particular industry, for many of the caves of Ariège and of Haute-Garonne yield them; and, if we take into consideration the form of the harpoons, we shall find similar examples in the Dordogne, and even in Scotland in the Oban cavern (Argyllshire); but it would be overbold to base a likeness of culture merely on the form of a single implement.

Tourassian Industry.—Among mesolithic industries we may cite, in passing, the industry A. de Mortillet¹ called Tourassian, considered by this archaeological authority as marking a stage in the degeneration and extinction of the Quaternary industry. He saw in this a special epoch, traces of which he believed he had found all over Europe, in the Mediterranean basin, and as far afield as India. In reality this industry does not seem to correspond so much to any particular culture as to special not very well defined needs common to many countries, and, probably, to different epochs, including, it would seem, the closing phase of mesolithic industry and the opening phase of polished stone.

The Industry of the Danish Kitchen Middens.—The kitchen middens, or food refuse heaps, are mounds of rubbish left by people near their habitations, sometimes on the very site of their encampment. These mounds are of all times and all places; in Western and Northern Europe, Japan, Brazil, Chili, Patagonia and North America, we find them on the coasts; in Egypt they are situated in the desert, at some hundreds of paces beyond the inundation zone of the Nile. Considered in the widest acceptance of the term, these remains of camps appear in all epochs, even in modern times.

In Denmark,² the kitchen middens include remains of the most ancient stone civilization known in the Scandinavian

¹ "Evolution quaternaire de la pierre," in **VIII** (1897), 24. A. De Mortillet "Les petits silex taillés à contours géométriques," **VIII**, VI (1896).

² Cf. **LXXV**.

region. These mounds formed as soon as the country was freed from ice and Man was able to take possession of it. They are generally five or six metres broad by two or three metres high, and their length varies between twenty and four hundred meters; they consist of heaps of shells and bones, hunters' débris, and include chipped flints of a special type, scrapers, paring-knives, cores, knives, drills, etc., carefully worked bones and deer horn, and fragments of coarse pottery. The polished axe is absent in these layers, which are considered to be synchronous with our Campignian encampments of Northern France. The hearths of earlier times, still undisturbed, are frequently found in these mounds and sometimes also the skeletons of the men who dwelt in these villages—formed, probably, of huts of branches covered with clods of earth and set in line in a long row on the coast.

Campignian Industry. — This industry, localized in the of Gaul, seems to have immediately preceded neolithic industry in this region; its tools consist of the scrapers, knives, notched blades, and drills of earlier times, to which are added paring-knives in great numbers, and picks.

The stations of this industry are found principally in the departments of the Somme and the Seine-Inférieure, under the form of hut foundations. Amongst the ashes, and about 60 to 80 centimetres high by 3 to 6 metres wide, are found the hearths, together with various objects such as worked flints, flint chips, fragments of pottery, generally crude, but occasionally decorated with geometrical ornament incised in the soft clay, and handmills and pestles. The polished axe is rarely found in the foundations of these huts; and that it is represented at all in this industry is still disputed.¹ Lanceolate or barbed arrow-heads, so common among neolithic implements, are entirely absent.

In 1872 the station of Campigny, near Blangy-sur-Bresle (Seine-Inférieure), was discovered by Eugène de Morgan,² and in 1886 Ph. Salmon suggested a "Campignian epoch" as a separate classification.

Although many other encampments of this kind have been recognized in the last few years, opinions on the subject

¹ XXVI, I, 326.

² LIV.

of the industry are still divided. It has not been met with, up till now, in stratified beds superposed on older industries, or under others more recent. "These stations, which are very poor in polished hatchets," said G. de Mortillet,¹ "have an altogether peculiar individuality; they might well represent, in France, the beginning of the Neolithic Epoch."

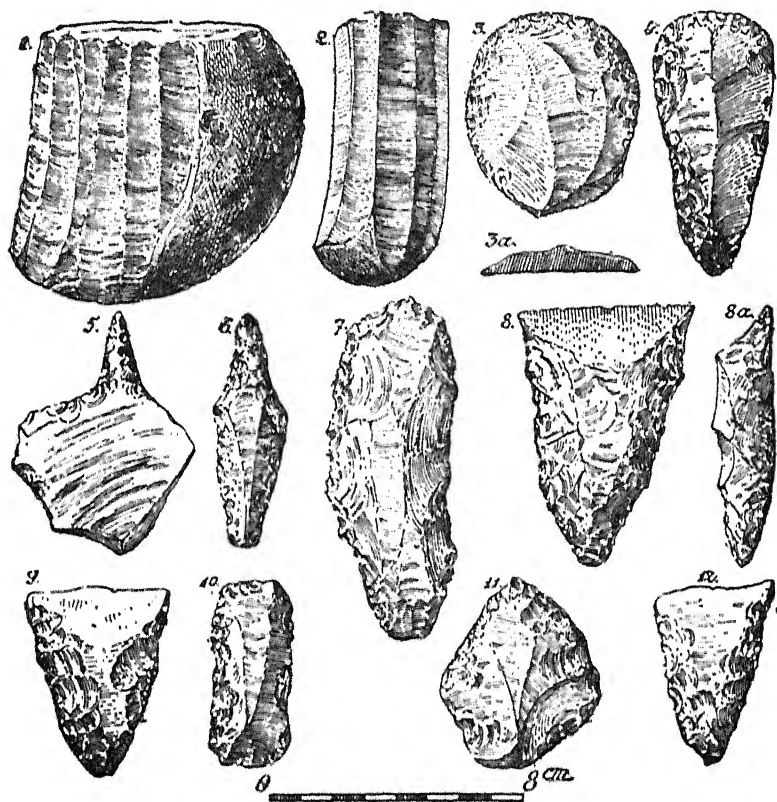


FIG. 27. Campignian chipped flints (Le Campigny, Seine-Inférieure). ¶

Mesolithic industries, though certainly numerous, have been ill studied hitherto, both in France and elsewhere, the reason being that the beds are always isolated and without stratigraphic relations with other industries; and that the neolithic burial-places are usually ossuaries where skeletons and funerary furniture of different epochs are mixed

¹ **XL**, 2nd. edit., 518.

together, thus making it impossible to know whether they were already in use during the period of mesolithic industry; and finally because the forms representing these industries in collections have usually been found on the surface. Perhaps we might include certain forms from North Africa and Syria among mesolithic industries. All that can be stated positively of them is that they only very rarely include special archæological forms, and that polished stone implements do not commonly appear in mesolithic layers.

I remember having found a neolithic flint axe-head, polished and re-worked at the edge, but not re-polished, in the foundation of a hut at Campigny in 1873. This observation permits one to suppose that the Campignian industry may have existed in the north of France at a time when the Neolithic was already making progress in other not far distant regions, and that the very rare polished axe-heads which sometimes appear in Campignian finds came into Picardy by commerce. It might be objected, however, that the Campignian villages had never ceased to be inhabited from the time of the appearance of neolithic industry in the country and therefore that the presence of polished axe-heads in the foundations of the huts may be due to subsequent occupation of such villages by men familiar with the art of polishing flint.

CHAPTER IV

NEOLITHIC INDUSTRIES

THROUGHOUT the world we see any number of innovations springing up with the rise of neolithic industry. It becomes obvious that this was the phase of development of human intelligence that opened up the real high-road to progress. The art of polishing hard materials, applied, as we have seen, to bone and ivory from Pleistocene times in the Solutrean and Magdalenian industries, has now become general; it is the method employed to give an edge to the hardest rocks, such as flint, jade, diorite, syenite, etc., and produces a form recognized as that best adapted to the use to which the implement is to be put. Man, still hunter and warrior, makes his arrow-heads in many different ways, but generally follows the earlier harpoon model, providing it with barbs (Fig. 28). He is no longer content with the skins of beasts for clothing, but weaves wool and vegetable fibres, perfects his ceramic arts, domesticates animals, raises cattle, builds dwellings on land and on the water, hollows out pirogues, and finally, cultivates cereals. The door of progress stands wide open for him to enter: he has but to develop his knowledge, to ameliorate the means of manufacture, and, when metal appears, he will have definitely left barbarism behind him.

While he ameliorates the conditions of existence, his power of thought develops; he seeks to discover the wherefore and the why of things, and from his meditations in the presence of the phenomena of nature, and the happenings of life, he evolves religious or superstitious ideas. His mode of sepulture bears witness to a belief in a second life; and architecture is born with the raising up of monoliths and the construction of dolmens and the covered alleys of burial mounds. The workman becomes a miner, and seeks in the bosom of the earth fine materials for tools and weapons; he delves in the ground and attacks the geological strata, and this raw material, flint, becomes an object of widely

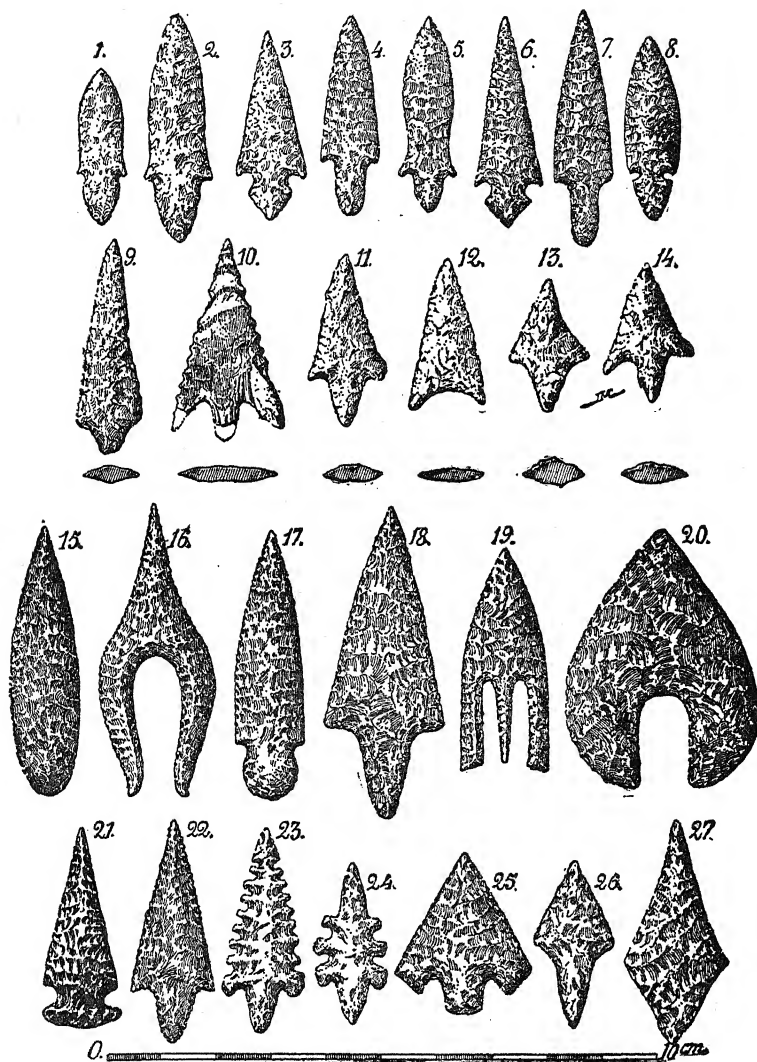


FIG. 28. Arrow-heads: 1-8, Abydos (Author's collection, given to the Musée de Saint-Germain); 9-14, Wagla (Pézard find); 15, Susa (Musée de Saint-Germain); 16, Alcala (Portugal); 17, Gironde (St-G.); 18, Aveyron (St-G.); 19, Dolmen of Gourillach (Finistère); 20, Fayum; 21, California (obsidian); 22, Aveyron; 23, ? (*id.*); 24 Finistère; 25, Loir-et-Cher; 26, Abruzzi (Italy); 27, Aube.

extended commerce, because in many regions it is absent. Large workshops come into existence to supply this export trade in chipped stone. The fine flints of Spiennes and of Grand Pressigny go as far afield as Switzerland, and amber from distant lands arrives in Gaul. Finally, Man protects his settlements with earthworks and fortifies himself on hill-tops.

The glyptic arts which disappeared with their authors, the Magdalenians, are replaced by crude representations of man himself or his weapons, and by geometrical ornament unworthy of the perfection achieved in stone working.

In Egypt and Scandinavia, thanks to the abundance and the fine quality of the stone in those countries, flint is transformed into genuine works of art in the shape of knives, daggers, javelin, lance, and arrow-heads, and the workmen become so skilful that they even chisel bracelets as light and fine in character as though made of metal. In the valley of the Nile, in the Elamite country, in Syria, Crete, and Greece, there appears a painted pottery which seems to be derived from a more ancient art whose origin is still a mystery.

However, according to the different localities and the peoples inhabiting them, a number of centres of neolithic culture became established, each one possessing its own qualities and characteristics. The type of implement differs from one country to another¹ to such an extent that an ethnologist accustomed to handle chipped flints has no difficulty in distinguishing their place of origin at first sight.

The multiplicity of neolithic cultural centres is beyond question, though it would be impossible to fix the geographical position of a single one of them. Without doubt these divers centres often reacted one on the other. The world over peoples were much mixed after Quaternary times; moreover, their industries overlap in a manner that becomes the despair of anyone who attempts to discover the origins of even a single human group.

The diffusion of amber, a northern material, as far west as our part of the world, shows how relations had been extended, and a number of proofs combine to convince

¹ Cf. for the polished stone age Hans Hildebrand, *Sur la subdivision du nord de l'Europe en provinces archéologiques* (Congrès de Bruxelles, 479-485).

us that in those days great movements of peoples still took place repeatedly, thus changing the face of Europe. Legendary history recounts to us some of these migrations.

If the environment to which the wave of invasion came was complicated by earlier migrations, the invading culture was not less modified. There were migrations in plenty which, travelling only along natural lines of communication, overran and crossed one another, leaving between them vast areas unaffected by their direct action. It would seem certain, for instance, that different peoples raised up the megalithic monuments and built the lake villages; and that divers types of neolithic industry, corresponding to different tendencies, imply diversity of ethnic origin. And as sometimes happens to-day, there were cultures side by side that were very diverse in development. Examination of the different tribes of Red-skins in South America provides striking instances even to-day, and the Dutch colonies of Malaysia show at least three degrees in advancement still persisting, although these three classes of men live side by side. To speak only of Western Europe, is it not conclusive in this regard to state the fact that in France and England the neolithic polished hatchet is rounded at the sides, whereas in the Scandinavian countries, Finland, the north of Germany, and the Baltic islands, it is trimmed and polished square on its surface extremities, and in the pile-dwellings its cutting edge alone is polished, and that in Italy it has a large groove?

If we generalize, the problem becomes still more insoluble; for the whole world, or nearly the whole world, has known the polished stone axe, as it has known the "coup de poing" of Acheulean type; but whereas the "coup de poing" is practically of the same type everywhere, this is not the case with the polished axe, whose form varies infinitely while preserving the same static principles.

Just as in the case of the study of Quaternary industries, those relative to neolithic cultures are still limited to European, West Asiatic and North African lands; for our knowledge as regards the other portions of the old continents and the New World (Fig. 29) still lacks precision. In America all these civilizations, so complicated in certain districts, so primitive in others, all included in one vague classification

as pre-Columbian, are known to us neither by their geographical dissemination nor by their epoch; whereas with those of the Old World we begin to see more clearly both their distribution and their succession in each region.

In the Scandinavian countries (Fig. 30),¹ there existed from the outset an industry in which the axe-head is polished completely or on its cutting edge alone; then comes the

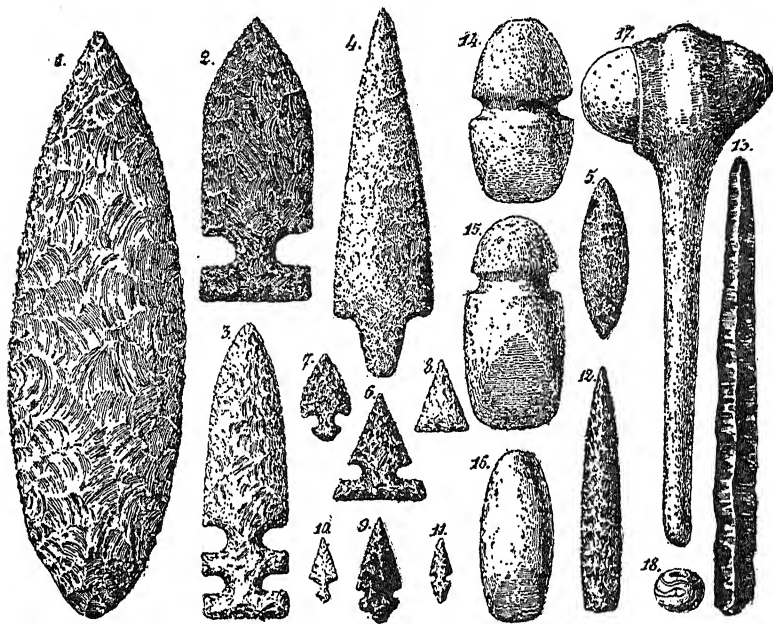


FIG. 29. Neolithic weapons and tools from North America.

appearance of the holed axe-head or axe-hammer, denoting a consummate skill in the working of stone; finally the establishment of a transition phase corresponding to the appearance of metal (eneolithic industry).

In Spain,² three periods may be distinguished: first, a local industry of archaic aspect, with a few polished objects, probably imported, corresponding to the period of the Portuguese kitchen middens (mesolithic industry?), but not to that of the analogous civilization in Scandinavia; then the full development of polished stone and ornamented

¹ Cf. LII; LVI.

² LXIII.

pottery, an industry reminiscent in both art and technique of the culture of the earliest of the Hissarlik cities; finally, the zenith of flint working and the beginning of the metal age (eneolithic).

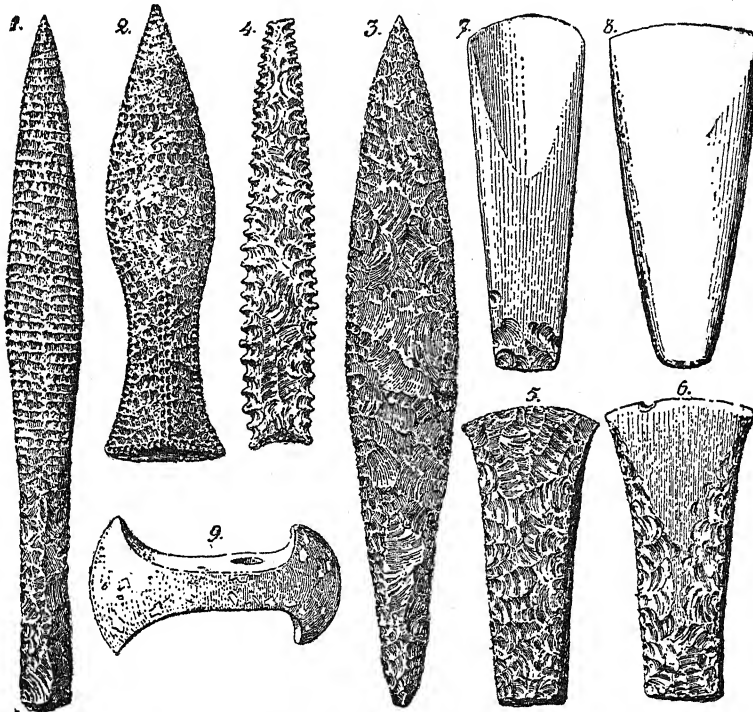


FIG. 30. Scandinavian Neolithic Implements (Denmark and Sweden).

In Switzerland, the lacustrine industry comprises three successive periods: first of all, that of small axe-heads, hardly polished at all, and made from native rock; contemporaneously, bones are worked in a rudimentary fashion, and the coarse pottery is unornamented (Fig. 31); then comes the industry of larger axe-heads, simple or holed, of rock often foreign to Switzerland; while the pottery, not quite so coarse, is simply decorated. Finally, holed axe-hammers appear, and are numerous in certain stations; work in stone, bone and horn is from that time at its zenith; foreign stone is no longer seen; the pottery is more and more ornamented; and metal makes its appearance (eneolithic).

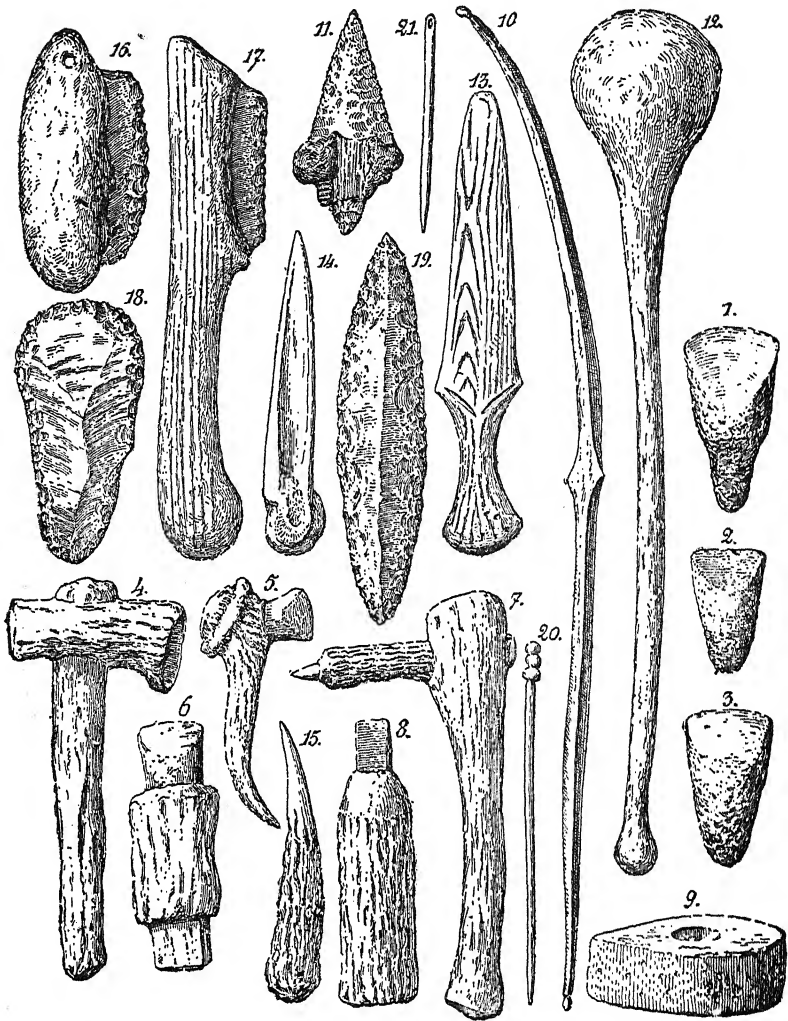


FIG. 31. Neolithic implements of the Lake Villages—1, 2 and 3, Axe-heads polished at the edge only (lake of Neuchâtel) ($\frac{1}{2}$ N.S.); 4, Hatchet-handle (lake of Neuchâtel) ($\frac{1}{2}$ N.S.); 5, Hafted axe-head (lake of Neuchâtel) ($\frac{1}{2}$ N.S.); 6, *Id.* (lake of Chalins) ($\frac{1}{2}$ N.S.); 7, Adze (lake of Bienne) ($\frac{1}{2}$ N.S.); 8, Chisel, (Latringeu, Switzerland) ($\frac{1}{2}$ N.S.); 9, Axe-hammer (lake of Neuchâtel) ($\frac{1}{2}$ N.S.); 10, Bow (Robenhausen, Switzerland) ($\frac{1}{2}$ N.S.); 11, Arrow-head (lake of Neuchâtel) (N.S.); 12, Club of yew-wood (Robenhausen) ($\frac{1}{2}$ N.S.); 13, Dagger of yew-wood (Robenhausen) ($\frac{1}{2}$ N.S.); 14, Bone awl (lake of Neuchâtel) ($\frac{1}{2}$ N.S.); 15, Awl of deer horn (lake of Chalins) ($\frac{1}{2}$ N.S.); 16, Saw mounted in wood (Robenhausen) ($\frac{3}{4}$ N.S.); 17, *Id.* (lake of Moosseedorf) ($\frac{3}{4}$ N.S.); 18, Flint scraper (lake of Neuchâtel) ($\frac{3}{4}$ N.S.); 19, Flint point (lake of Neuchâtel) ($\frac{3}{4}$ N.S.); 20, Bone pin (lake of Neuchâtel) ($\frac{1}{2}$ N.S.); 21, Bone needle (lake of Neuchâtel) ($\frac{1}{2}$ N.S.).

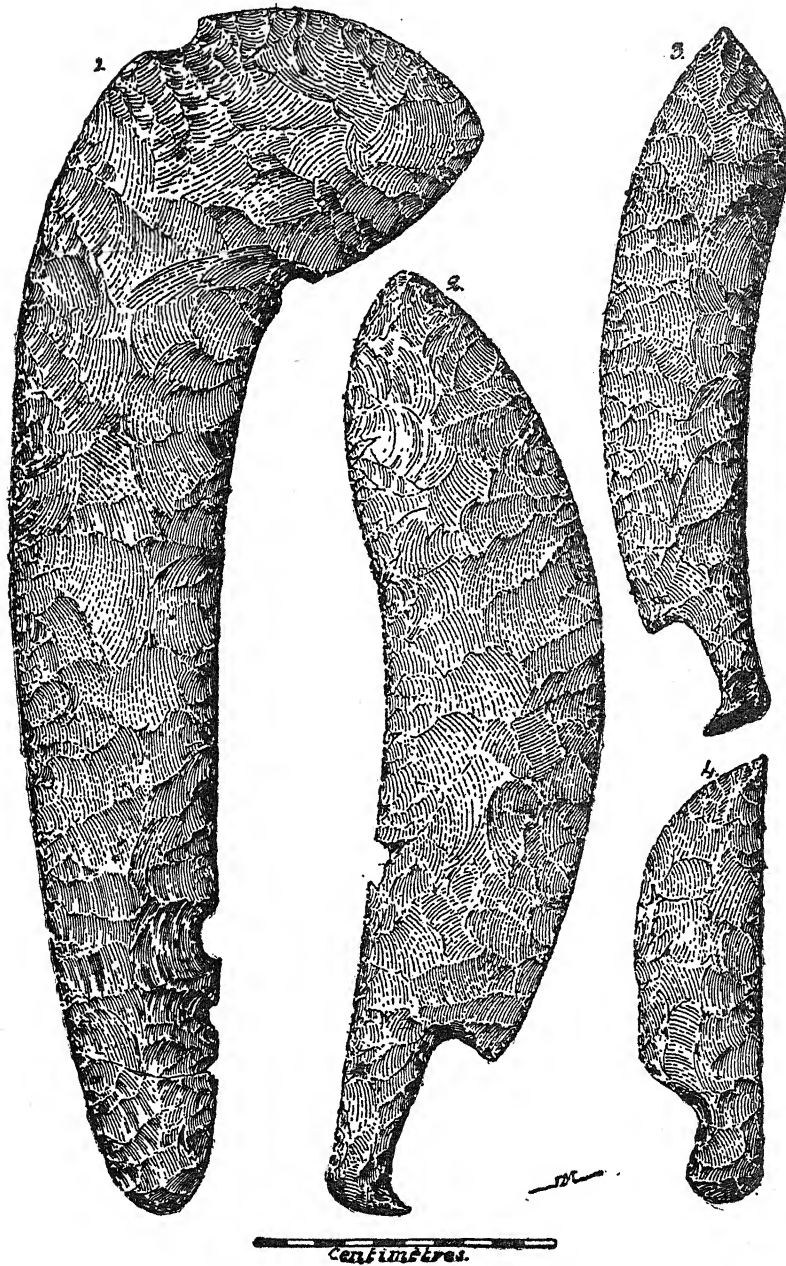


FIG. 32. Flint knives, Messawiyeh (Upper Egypt—Garstang excavations).

In Italy, where polished axe-heads in flint are never seen but the celts are all made of some hard rock, it would seem that two neolithic currents met and united—one coming from the Jura and Switzerland, which, having crossed the Alps, appears to have come down the valley of the Po and the Tessin without crossing the Po, while the other, coming from the basin of the Danube, via Istria, Emilia, and Venetia, appears to have advanced along the Adriatic coast as far as Apulia.

For France, the south of England, and Belgium,¹ it would seem that we must adopt three divisions: first of all, an industry very close to the Campignian but having the characteristic Neolithic polished celt and arrow-head; then, that of the axe-hammer corresponding to the introduction of foreign stone and the zenith of flint working; finally, the use of metal concurrently with the preceding industry, the pottery improving during the course of all three phases.

In Egypt (Fig. 32 and Fig. 33),² there must have been but two phases, that of the polished axe-head of European type in which flint alone was used for all the tools,³ and the Eneolithic period in which flint working reached its zenith. Then we find hard stone and metal in use at the same time; pottery, ornamented with paintings in red ochre, now reaches its greatest perfection. We shall see later that the use of metal in the valley of the Nile, and the arts, appear to have come from Asia.

In Elam (Fig. 34) and in Chaldea (Fig. 35 and Fig 36), we also find two phases, that of the polished axe-head of European type,⁴ though flatter, and the Eneolithic industry with its admirably painted ceramics, already very stylistic, its varied implements, its axe-hammer, its points of Solutrian type and its very primitive weapons and utensils in metal.

The Sahara and Tunis (Fig. 37) show an industry which presents considerable analogy with that of Egypt, but we do not find there those large, marvellously worked blades of the

¹ For Belgium, Rutot (**LXII**), divides the Mesolithic and the Neolithic into five phases: 1st, Tardenoisian; 2nd, Flénusian; 3rd, Campignian; 4th, Robenhausian; 5th, Omaliën.

² **XXXIX.**

³ The existence of this phase in the valley of the Nile is doubtful.

⁴ Here too the existence of this phase is doubtful.

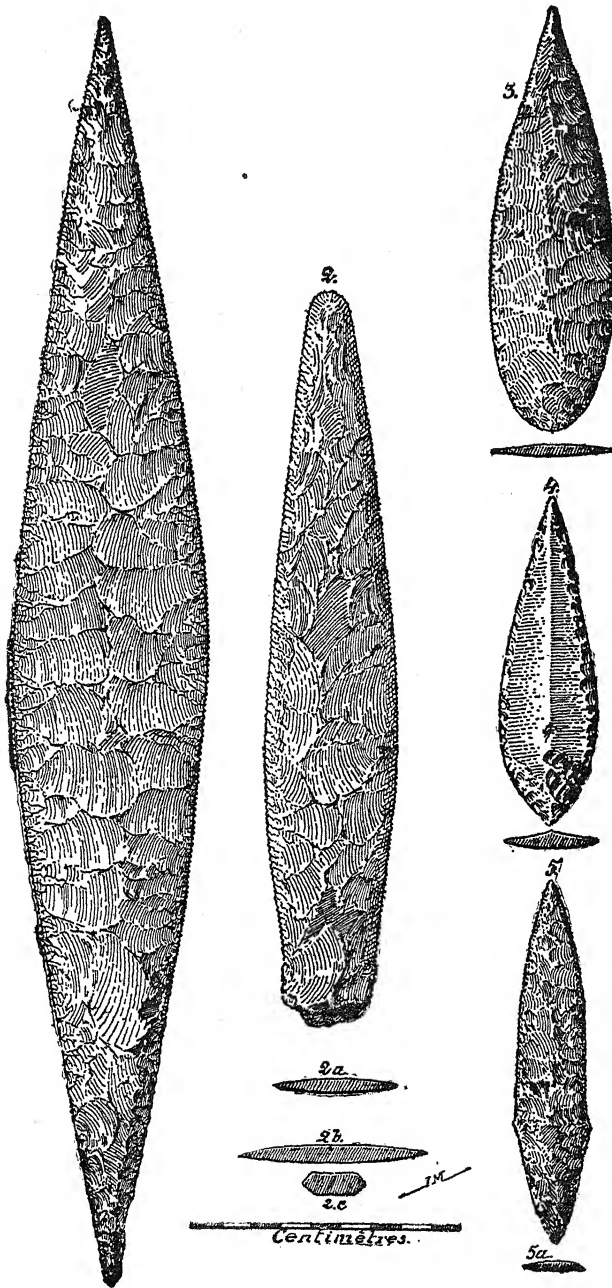


FIG. 33. Flint points from Upper Egypt: 1 and 2, Adimiyeh (Henri de Morgan's researches); 3, 4 and 5, Nakada (Flinders Petrie's researches).

valley of the Nile. The industry of Palestine is more nearly related to that of Egypt (Fig. 38) than is that of North Africa.

This is practically the limit of our knowledge of the subdivisions of neolithic industry in lands explored up to the present. As we can see, evolution in each country has

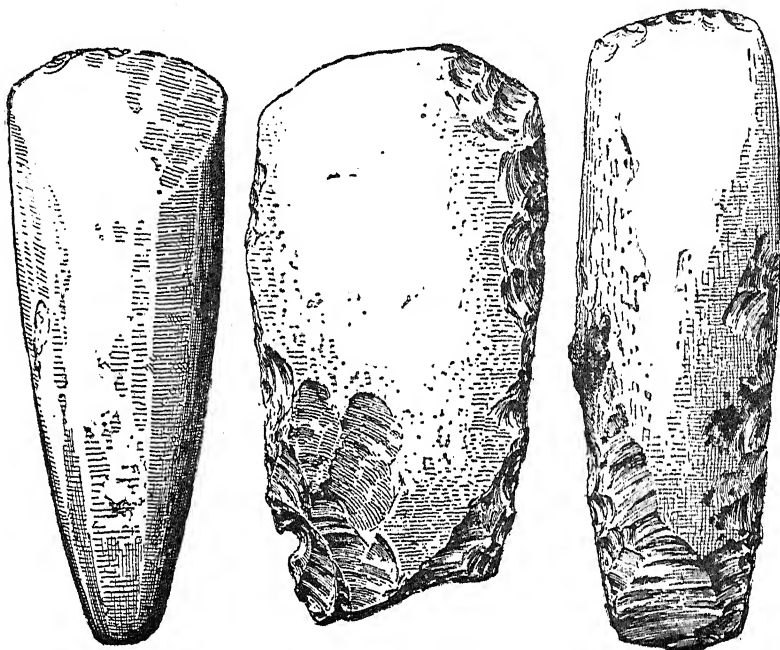


FIG. 34. Polished stone axe-heads. Tepeh Gulam (Pusht-i-Kuh and Luristan).

been independent in its main lines; but these differences are also often due to foreign influence.

As to the date to be assigned to neolithic industry, it varies, naturally, in different localities. Montelius, taking as his basis the stratigraphy of the Tell of Susa and observations of the same order made in Egypt, allows 20,000 years for the appearance of the polished axe-head in Elam and in the valley of the Nile. This estimate is much too high, for it would give some 12,000 years as the duration of the strictly neolithic phase in these two countries, whereas the remains of neolithic industry in Egypt and Elam are not sufficient to justify such an estimate. In any case we

have to admit that we do not possess any basis for fixing chronologically the beginnings of this culture in any country. Hence any estimate in this respect can only be made in the domain of the imagination.

As regards its closing limit we are somewhat better informed, because then we approach historic times. In Chaldea it was towards the end of the sixth millennium before our

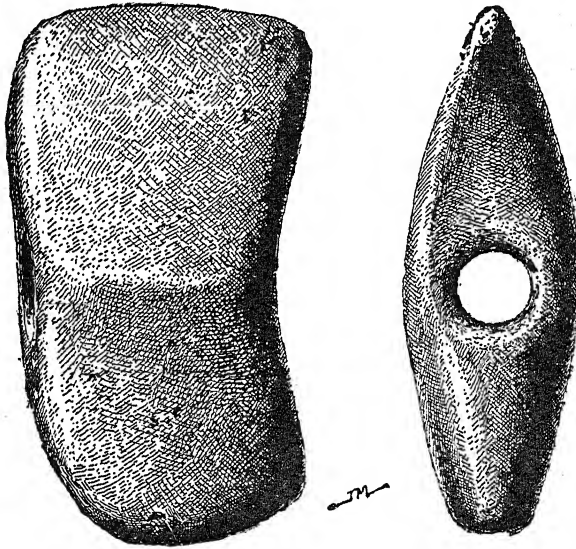


FIG. 35. Axe-hammer in serpentine. Chaldea. (Author's collection, Musée de Saint-Germain.)

era that metal put an end to neolithic industry in this region, if indeed it ever existed there, which I consider very unlikely, and the date would be about the same in Egypt;¹ whereas the Ægean civilization was born at the very earliest in the 30th century B.C., and Scandinavia could not have known bronze until the 18th or 22nd century B.C. In Gaul, in Switzerland, and in neighbouring lands this evolution probably took place about the 25th century; while Finland must have replaced its stone weapons by iron implements about the 5th or even the 3rd century B.C. without passing through the almost universal intermediate stage of copper

¹ XXXIX; *Le tombeau de Négada*, Paris, 1897, XXXV.

and bronze, and many tribes of Polynesian and other regions discovered by Europeans in modern times would have reached the 18th or 19th century A.D. before putting aside the stone axe and taking to firearms. We have seen already that Lower Chaldea seems never to have known Man in possession of a really neolithic industry; and

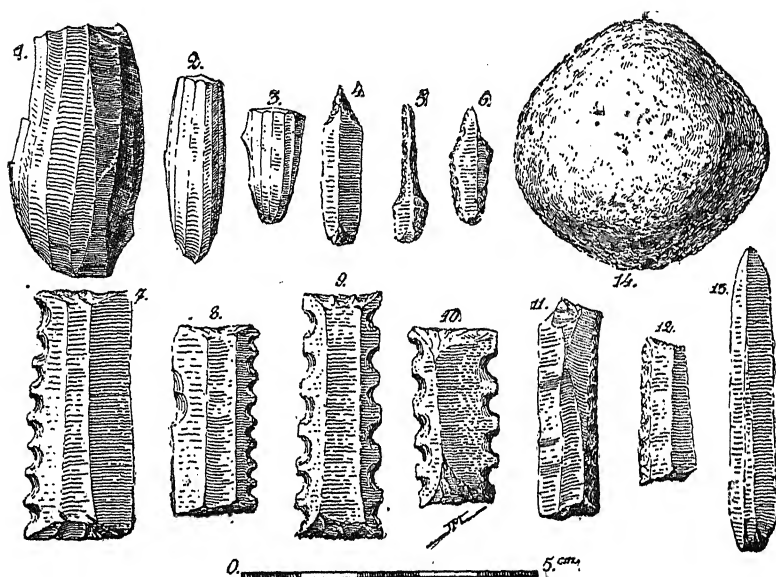


FIG. 36. Flint implements. Yokha (Chaldea). Author's collection (Musée de Saint-Germain).

that at the time when it was populated the people of the mountains bordering it on the north-east and on the north already knew copper.

It would be beyond the scope of a study such as this, which has for object the discussion of the progress of humanity as a whole, to describe the innumerable neolithic industries of different localities; we give in the illustrations the principal types of some of them, and the reader will be able to judge their characteristics for himself. We must, however, note that no other district ever equalled the perfection of stone-trimming reached in Egypt and Scandinavia, and the workers of the valley of the Nile greatly excelled in skill those of Denmark and the south of Sweden.

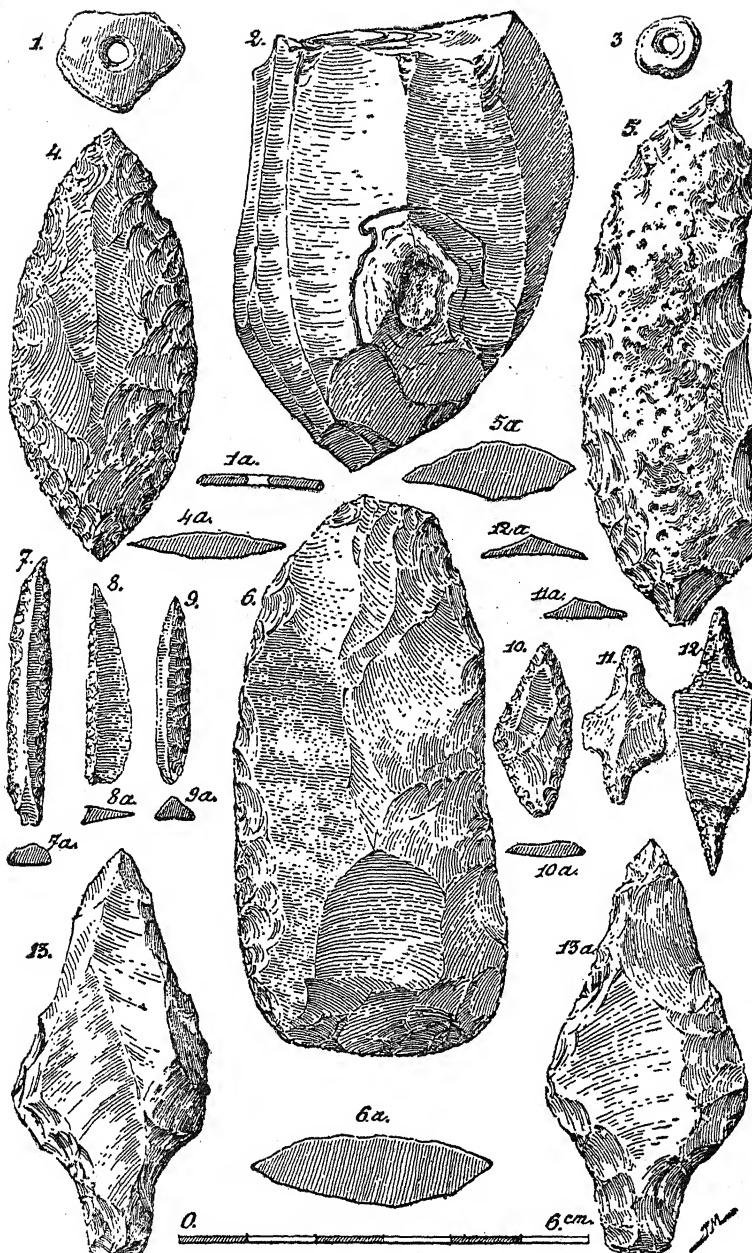


FIG. 37. Neolithic industry, Sahara (Péard's researches) (near Wagla) : 1 and 3, Ostrich shell; 2, Light opaque flint; 4, Brown flint, veined black; 5, Grey flint, white patina; 6, Light opaque flint; 7 to 9, Translucent yellow flint; 10, Light opaque flint; 11, Opalescent, translucent flint; 12, Yellow flint; 13, Opalescent translucent flint.

Still, it is quite possible that in the one as in the other, copper was already known when these admirable implements were made, in spite of our not finding it in Denmark, and although in Egypt we find the same trimmed flints, both alone and accompanied by metal.

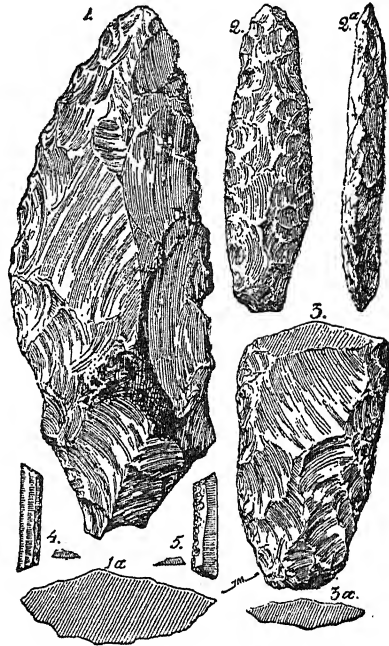


FIG. 38. Neolithic implements, Palestine : 1-3, Sur Baher (Jerusalem) ; 4-5, Valley of Hesban (after Vincent).

However, before leaving the subject of neolithic industries we will review some of the forms of these polished axe-heads, and demonstrate how much these implements vary (Fig. 39).

Types 1 and 2, widespread throughout Europe, are found also in Western Asia and in India, among other countries, while No. 5 with square sides characteristic of the Scandinavian countries, the north of Germany and Finland, is found also, although more rarely, in Western Europe. No. 6 in hard stone, such as syenite, diorite, etc., is universal ; No. 7 is rare in the West as are also Nos. 8 and 9 ; Nos. 10 and 18, characterized by the fact that the implement is flatter and less rounded in section than in France,

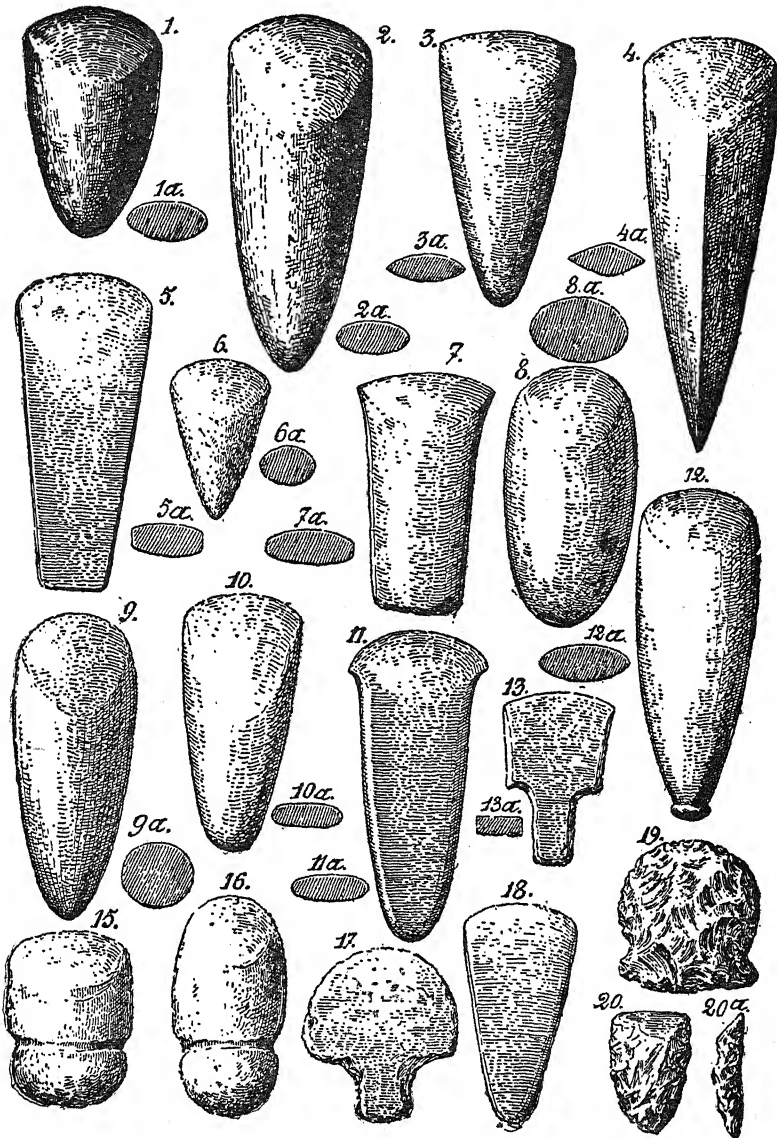


FIG. 39. Various forms of Neolithic axe-heads: 1, France and all Western Europe; 2, *Id.* the most frequent type; 3, Jadeite (Seine-et-Marne); 4, *Id.* (Brittany); 5, The most frequent type in Scandinavia, Finland and North Germany, existing also in Western Europe; 6, Of universal distribution; 7, Western Europe, rare; 8, *Id.* rare; 9, *Id.* rare; 10, Susian and Chaldean, flat type rounded at the sides; 11, Jadeite (Gers); 12, Antilles; 13, Cambodia; 15, United States; 16, *Id.* Western Asia; 17, Susa; 18, *Id.* very flat type; 19, Egypt; 20, Egyptian type, flat on one side.

are found in Elam and Chaldea. No. 12, rare in Europe, is found in the Antilles, while No. 13, highly specialized, seems to be peculiar to Indo-China. Nos. 15 and 16 are common in the United States, but are known also in Europe and Asia. The salt mines of Kulpi in Transcaucasia have yielded us a few of these implements.

Type No. 17 seems to be peculiar to the Elymaids and

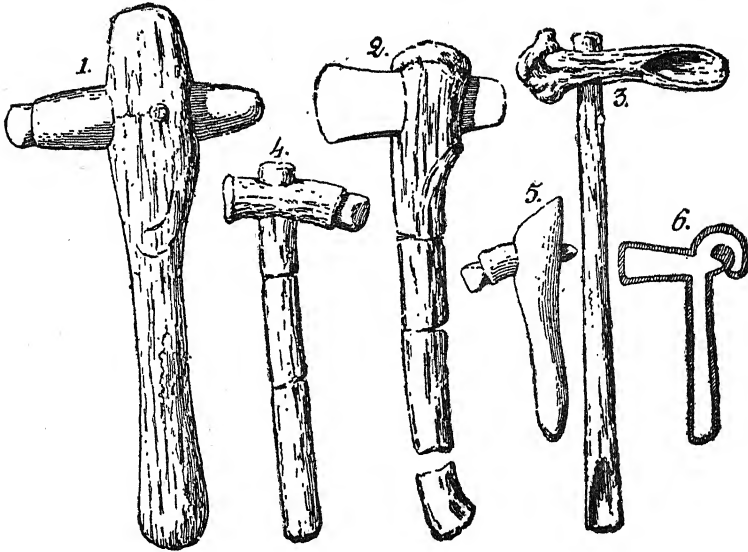


FIG. 40. Method of hafting polished stone axes: 1, La Lance (Musée de Saint-Germain, gift of the author); 2, Zeeland (Denmark); 3, Clairvaux (Jura); 4, Bay of Penhouët (Loire-Inférieure); 5, La Lance (Switzerland); 6, Gavr'inis (Morbihan).

type No. 19 to Egypt; metal implements having these forms are known—but has the metal tool been copied from the flint or vice versa? It is impossible to say. Then comes the axe (or paring-knife) flat on one face, a speciality of the valley of the Nile, though inspired by the same principle as the Campignian paring-knife.

Finally Nos. 3, 4 and 11 show implements of jadeite, a material formerly considered to have been imported into Gaul from distant lands (?Siberia), but now regarded as indigenous in France.

The polished axe-head was hafted, and we possess a number of examples with handles (Fig. 40, Nos. 1 to 5); we

see them figured in contemporaneous neolithic sculpture (Fig. 40, No. 6). Usually the axe-head was set in a sawn and hollowed piece of deer horn, and the horn socket itself was usually hafted crosswise on to a wooden handle.

Grooved implements were generally hafted directly into the wood. Implements such as saws, gouges, paring-knives, scrapers, and graving-tools were frequently hafted either in wood, horn, or bone.

Among the most common and at the same time the most varied weapons of neolithic industry we must mention arrow-

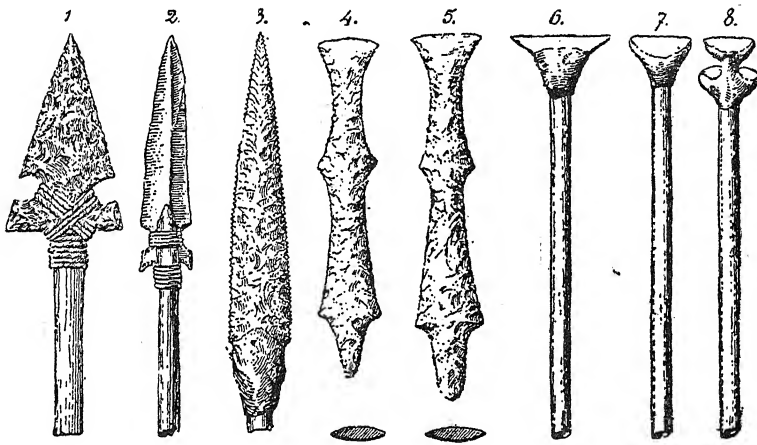


FIG. 41. Method of hafting flint arrow-heads: 1, California (after A. de Mortillet); 2, Helwan (Lower Egypt); 3, Abydos; 4 and 5, Abydos (after Flinders Petrie); 7 and 8, straight-edged arrows of the Egyptian historical period; (Author's collection, Musée de Saint-Germain).

heads, which are found in great numbers in nearly every station in all countries. The variety of shapes is infinite, although we possess flint arrow-heads only and a few made of bone; those made of wood, horn, and fish-bone have disappeared.

The method of hafting these arrow-heads (Fig. 41) was itself very varied; we possess a few antique specimens and others among our ethnographic collections in our museums.

It will be noticed that the straight-edged arrow-head in use among the Egyptians in historic times (Fig. 40, Nos. 6, 7, and 8) (Middle Empire), was already employed by the contemporaries of the first dynasty (Fig. 40, Nos. 4 and 5),

who had made a true work of art of this weapon. But besides these beautifully finished arrow-heads, there were certainly others, made of a simple untrimmed chip, of which we probably come across numerous specimens without recognizing their purpose. And this is very likely true of a number of implements belonging to all the stone industries, either very slightly or not at all trimmed, whose use remains unknown.

Thus neolithic forms vary infinitely and are distributed over a number of districts in different periods. Some of these industries are very old, and others are contemporaneous with our own day; but no matter to what age or land they belong, they all reflect the same ideas in the men who fashioned them, and thanks to the exigencies of the material, all present an air of relationship, although in most cases these diverse industries are absolutely independent of one another.

CHAPTER V

ENEOLITHIC INDUSTRIES

ITALIAN archæologists have given to the cultural phase in which a few metal implements are found with neolithic remains, the name of eneolithic. This phase characterizes the transition between the use of trimmed stone and of bronze. There is still no knowledge of alloys, but only of the two metals, copper and gold, which are found in the pure state in all parts of the world.

We must not, however, include in eneolithic industry those copper implements that have been simply forged, such as those of the North American Indians: these belong to neolithic culture, since the metal has not been smelted, but is merely hammered. By the Eneolithic we mean a phase of culture resulting from the first steps in metallurgy.

Implements of pure copper had been in use for a considerable time in nearly all countries. They are found all over Europe, in Asia as far as, possibly even further east, than India, but they would seem to be absent in Japan; throughout Africa—except Egypt—and, naturally, in Oceania, a region in which worked stone was still in use up to our times.

Was copper first found in one country, from which the knowledge of it spread to other regions, or was the discovery of multiple origin? We do not know for certain, but, as we meet with it at the foundation of every civilization, it is likely that it was in the countries of the most ancient culture that these centres, though in themselves perhaps secondary, were established, and that from these centres the precious discovery was spread abroad.

These lands of very ancient culture are few, and only Chaldea, Susa, Egypt and the Ægean Islands are entitled by their antiquity to be considered in this connection.

During the last few years this antiquity has been lessened by ten centuries by German scholars¹ who refuse to acknowledge the old chronology of Nabonidus, and this thesis has been accepted in France by a good number of archæologists.² But as this new theory—which is already being abandoned

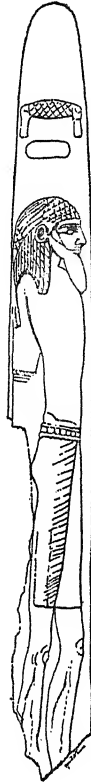


FIG. 42. Ivory. Tomb of King Qau (First Dynasty).—Flinders Petrie, *The Royal Tombs*, 1900, Part I, pl. XII, Fig. 12, 13.

in many quarters—allows neither time for oriental civilization to develop nor for the dynasties to succeed one another without too greatly overlapping, we shall abide by the old chronological estimates.

In these conditions the culture of the Pharaohs would have

¹ Édouard Meyer (*Ägyptische Chronologie, Abhandl. Berlin. Akad.*, 1904, and *Nachträge, id.*, 1907) based his theory on astronomical calculations. See the objections of G. Maspero in **XI** (1905, II, 203).

² Cf. **XXVI**, II, 1st part, 54; **XXVII**, 2nd edition, 1914, table, pl. XIII, etc.

begun in the second half of the fifth millennium before our era. In any case we are faced with the problem as to whether this culture was indigenous or was brought in by foreign influences. We shall show how, at an early date, during the Egyptian neolithic industry, the valley of the Nile underwent Asiatic influences, and was probably even occupied for a time by a population that had come from Mesopotamia, and that these conquerors would have thus brought into Egypt the knowledge of copper. Later, we shall see that it was at this period, also, that ceramic art would seem to have first shown itself among the pre-Egyptians.

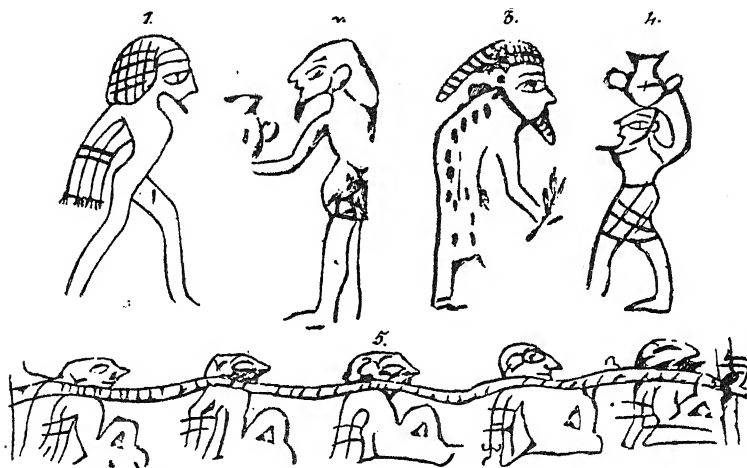


FIG. 43. Representation of man at the beginning of the Pharaonic epoch. (After Flinders Petrie, *The Royal Tombs*, 1901.)

In the tomb of the first dynasty, king Qau, Flinders Petrie¹ discovered an ivory plaque representing a captive of distinctly Asiatic type (Fig. 42), though the author himself thought it was Libyan. Other representations of the same period show that even then the artists took special care to differentiate ethnic characteristics. Elsewhere on a schist plaque now in the British Museum (Fig. 44) we see at the upper right hand corner a person dressed in a long robe of Asiatic fashion, pushing before him a naked captive,

¹ *The Royal Tombs*, 1900: part I, pl. XII, Figs. 12 and 13; pl. XVII, Fig. 30.

while at the left another naked person is fleeing; in the centre we see a lion and various birds of prey devouring the corpses after a battle. The conquered are Africans, they wear beards in the Egyptian manner and have crinkled hair; it is likely that in those primitive times the race peopling the borders of the Nile was not of pharaonic type and that, if smooth-haired men existed in those regions, it was further north, in the delta then forming.

These documents, and many others, show beyond doubt that at a time getting on towards the period of the first dynasty, earlier rather than later, Egypt was the theatre of conflict between two peoples of distinct race, and they also inform us as to the nature and origin of the invaders.

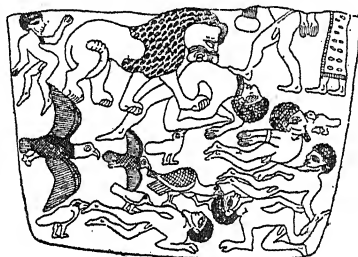


FIG. 44. Schist Palette, Archaic Egyptian. (British Museum.)

The same fact is brought out by a comparison of Figs. 45 and 46, where we have grouped the principal industrial and artistic forms common to pre-Pharaonic Egypt, Chaldea and Elam. It must be conceded that these analogies are such that it is impossible to deny the influence of the one civilization on the other.

The presence of the Asiatic divinity in Egypt (Nos. 2, 3, 5, 6, 27, 33) and the cylindrical seal which, as is known, is of Chaldean origin, can leave no doubts on the subject of the centre whence came the culture which was to be transformed later into the civilization of the Pharaohs.

Thus, it would seem likely that the knowledge of copper (Fig. 47) came to Egypt and the Asiatic coasts of the Mediterranean from Chaldea. But this deduction advances us little in regard to the country in which copper was discovered (Fig. 48): for we have never found in Chaldea, as we have done in Elam and the Iranian plateau (Fig. 49), any

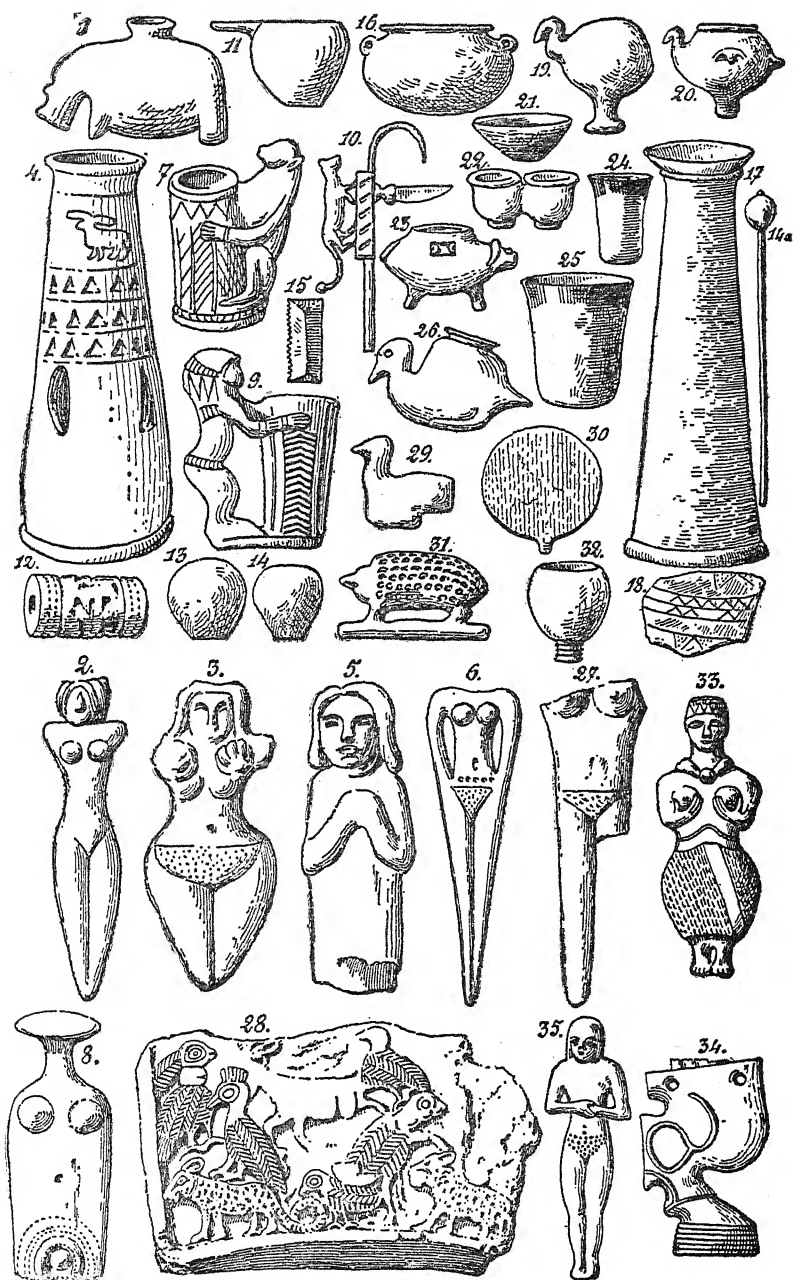


FIG. 45. Principal objects of archaic Egyptian period.

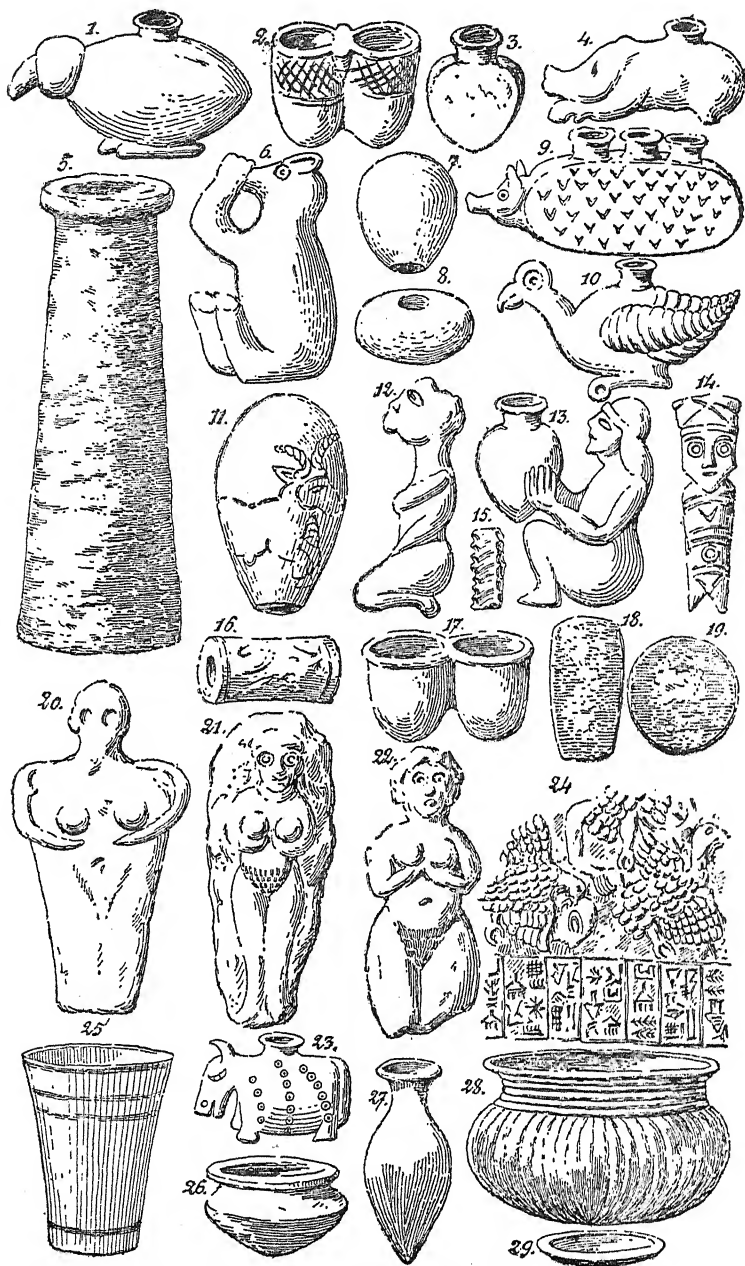


FIG. 46. Principal objects of archaic Susian and Chaldean period.

definite traces of purely neolithic industry, and we know, by the study of the formation of the delta of the Chaldean rivers, that that district was not habitable till relatively late. It was thus neither in Chaldea nor in Iran that the first metallurgical essays were made. Nevertheless, it is highly probable that Western Asia was at least one of the principal secondary centres whence the knowledge of metal was propagated, though we are still ignorant of the actual point at which metallurgy first developed.

The principal types of copper implements would have spread from the Mediterranean coasts and from Central Asia into the Mediterranean islands first, then into Western, perhaps even into Central and Northern Europe, being modified by the different neolithic cultures into which they penetrated, but retaining their principal characters of the flat axe-head and triangular dagger; and if a few rare Egyptian, Phœnician, or Ægean objects reached the confines of Europe, it was quite exceptional: it was the knowledge of metallurgical processes that spread, and not the metal object itself. The copper probably circulated in the form of ingots, as was the case with bronze, which was exported in the prepared state, containing the proper proportion of tin.

It would seem to be definitely proved to-day that the knowledge of copper reached Gaul simultaneously from the South and the East, that it came from the Black Sea and the Ægean, a district where this industry—according to specialists in Ægean questions—began towards the early part of the third millennium before our era; though naturally it took long centuries before it was propagated as far as the British Isles and Scandinavia. We do not contradict these authors as regards the age of civilization in the Mediterranean Isles any more than in Western Europe.

As for gold, we find it used as early as copper, together with which it is found in almost all the stations and in eneolithic sepultures. The tomb of Menes at Nakada, contained a very heavy gold bead in the form of a spiral. In the same way in the sepultures of Muqayyar (Ur of the Bible) and Warka (Erech) the tombs contain, in addition to stone and copper (and sometimes bronze) implements, crude ornaments of gold.

In spite of daily increasing discoveries, we are still in-

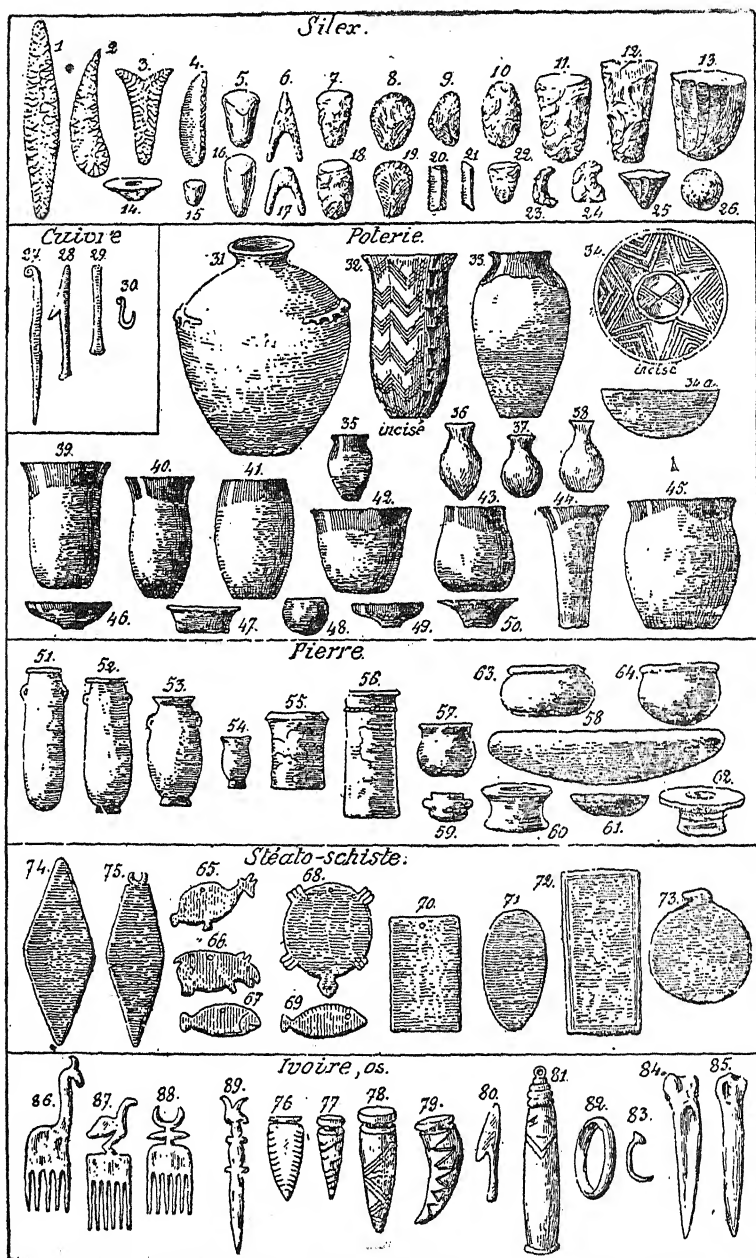


FIG. 47. Objects of pre-Pharaonic industry, Upper Egypt.
 (Silex=flint; cuivre=copper; poterie=pottery; incisé=incised;
 pierre=stone; stéato-schiste=steatitic-schist; ivoire=ivory; os=bone.)

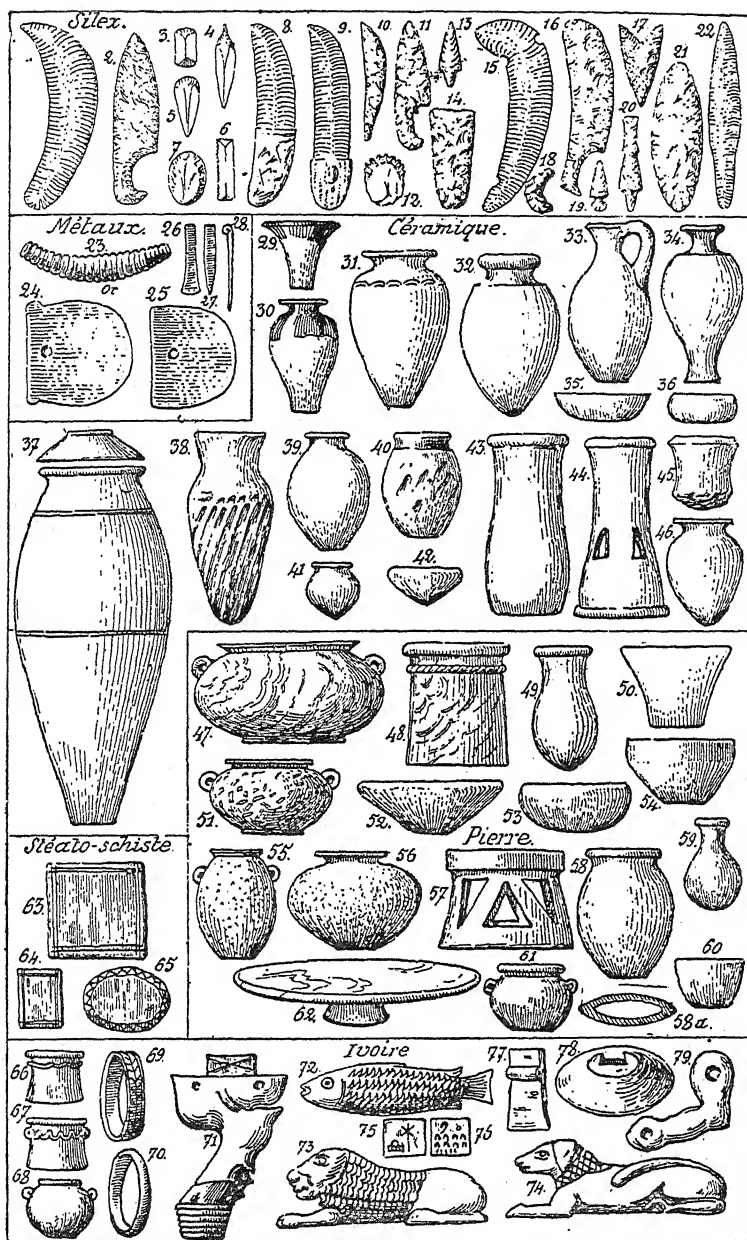


FIG. 48. Objects of Eneolithic industry in historical Egyptian times.
Objects of the First Pharaonic Dynasty.

(*Silex*=flint; *métaux*=metals; *céramique*=pottery; *stéato-schiste*=
steatitic-schist; *pierre*=stone; *ivoire*=ivory.)

sufficiently informed as to the extent and duration of eneolithic industry ; it is only by numerous chemical analyses that we

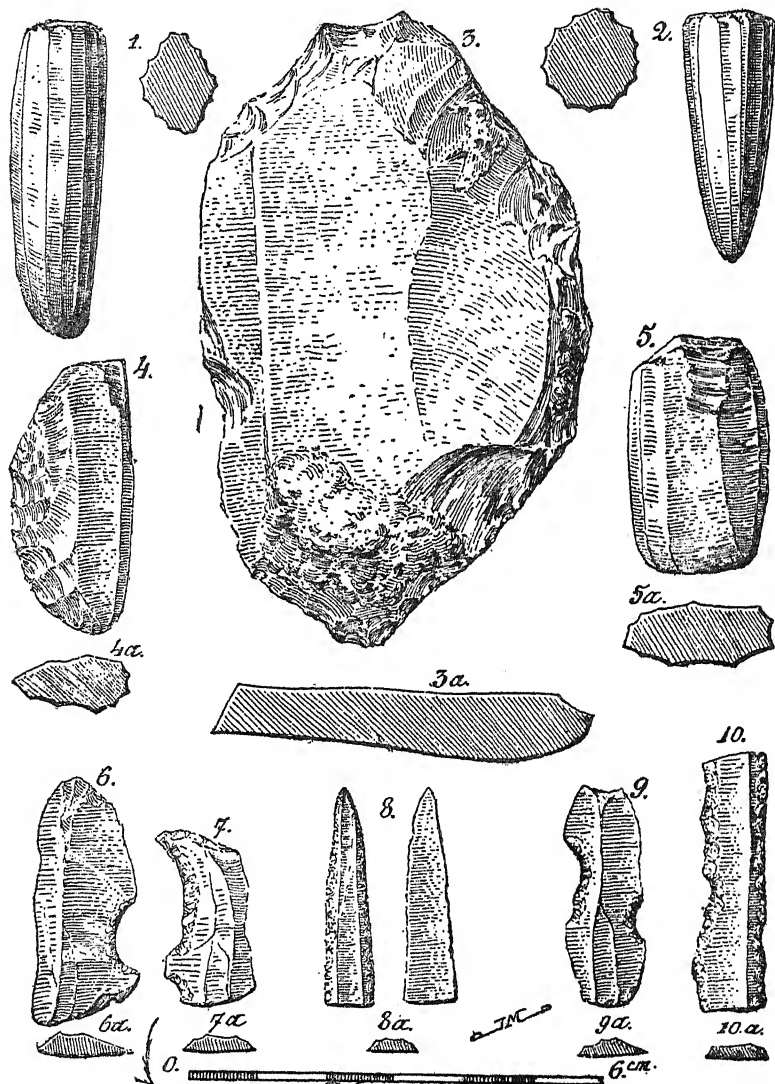


FIG. 49. Tepeh Gulam (Pusht-i-Kuh).

can possibly pronounce on the question, because the use of bronze is grafted on to that of copper, and stone, copper, and bronze implements are frequently found together. Further,

most archæologists, though recognizing the existence of a copper industry and placing it in the last neolithic phase,¹ do not arbitrarily differentiate it² from the bronze industry.

The appearance of metal (Fig. 50) did not, as we might suppose, occasion a revolution in the established order of

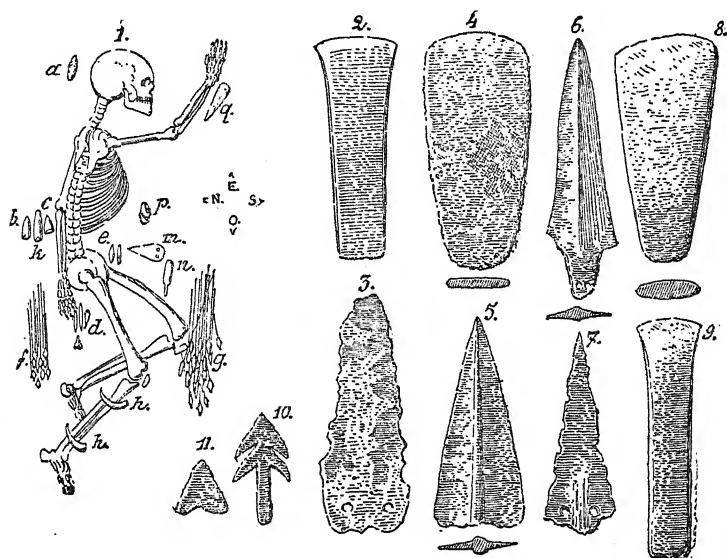


FIG. 50. 1, Eneolithic sepulture at Fontaine-le-Puits (Savoie): *a*, javelin head; *b*, *c*, Jadeite axe-heads; *d*, knives and paring-tools; *e*, knives and large arrow-points; *f*, 10 flint arrow-heads; *g*, 22 flint arrow-heads; *h*, boar's tusks; *i*, flat axe-head in copper (No. 2); *m*, copper dagger; *n*, copper awl; *p*, a shell; *q*, copper pendant. 4, Susa, copper. 5, Crete, *id.* 6, Hissarlik, *id.* 7, Spain, *id.* 8-11, Adimiyeh (Egypt), *id.*

things; in most instances its use came in slowly and by contact with metal-users, rather than by invasion, and it penetrated into neolithic environment very gradually. In the earlier stages, weapons and implements of metal were scarce because of the rarity of copper, which at first was only an object of trade; the forms of flint implements were copied in copper—and even *vice versa* occasionally. Then, metallurgy becoming established in the mining countries, and commercial relations being extended, most of the stone types disappeared; but this substitution of metal for stone was very irregular and

¹ Cf. XXVI, II, 1st part.

² XLI.

very slow; worked stone continued in use for a long time; it was employed for the heads of such projectiles as, from their destination, were bound to be lost. It was thus that, even when iron was known all over the Old World, arrow-heads and the heads of throwing-spears continued to be made of stone as well as of metal. Then, in certain ritualistic practices, the use of stone remained *de rigueur*; it persisted indeed for thousands of years. In Egypt, the disembowelling of bodies to be mummified was done with a flint knife¹, and a flint knife was used for circumcision² among the Asiatics. The use of stone for the latter purpose enables us to understand the important place that was taken by work in obsidian for exportation in Ægean districts.

Thus eneolithic industry, properly speaking, is not a well-defined stage of human culture—it is only a transition phase, and nowhere does the appearance of copper modify the customs and usages of the neolithic peoples. Copper represents neither an epoch nor any definite duration of time, since its propagation was irregular in progress according to different localities; and as the use of bronze came about in the same way, certain areas remained for a much longer period than others in this transition stage, as, for example, Hungary.

It should be noted that metal, being an extremely precious material, was handled with great care at its inception, and thus that many stations classed as neolithic because copper is absent, really belong to the eneolithic stage; some archaeologists are even of the opinion that the concluding polished stone phases, among different peoples, should all be ranged with the new-born metal industry; I am not far from sharing this opinion as regards Egypt and North Africa.

¹ Hesiod, bk. II; Diodorus Siculus, bk. I, cf. XLVII, 9.

² By the Jews and Phœnicians among others.

CHAPTER VI

BRONZE INDUSTRIES

Discovery of Metals and Metallurgy.—Bronze is an alloy of copper and tin, which has qualities of hardness greatly superior to those of pure copper, a soft metal that is very malleable; bronze is to copper what steel is to iron. But it is not only by alloying it with tin that copper can be hardened; a very small proportion of arsenic¹, antimony or zinc² modifies the molecular state of copper. These processes were perhaps attempted in a halting manner by the Ancients, but we cannot be sure, because such alloys may be—indeed probably are—the result of impurities in the copper ore treated.

A 10 per cent. alloy of tin gives to copper the qualities proper to the use for which the weapons and tools were destined; a higher tin percentage renders it increasingly brittle; a content of 30 per cent. of tin gives a very fragile white metal which was used in olden times for mirrors.

The metallurgists of primitive times, not having at their disposal our modern scientific means, could only proceed by experiment—by successive attempts—and this is why the tin content of bronze implements varies so greatly. We must also take into account that if copper ore was abundant in the Old World, stanniferous beds were much more rare, hence there was often a complete absence of tin on the market of many lands. However, the composition that the metal founders of prehistoric times apparently desired to reach varied between 10 and 18 per cent. of white metal.

Copper is found in the natural state in the rare form of native metal, abundantly as metallic sulphides, and as oxides, carbonates and other ores resulting from prolonged contact of the outcropping copper veins and lodes with the

¹ Certain axe-heads from Hungary contain as much as 18 per cent. of arsenic. This high content would seem to be attributable to particularly impure ores.

² Cf. **XXVI**, II, 1st part, 175 ff.

atmosphere; the other natural combinations of copper are outside the scope of our consideration as regards this particular question.

Tin-bearing strata are much rarer and are limited to a few localities; the ore occurs in the original deposits in veins, and in the form of small crystals in crystalline rocks known as granulites; it is always an oxide (cassiterite) and never found as a native metal.

The attrition of rock-matrices and outcropping veins by atmospheric agencies produced alluvial formations in which stream-tin occurs in the form of sand; it is only necessary to wash this alluvium in order to extract the cassiterite. This is the method used in the exploitation of tin in Malaya, at Brangka, Perak and elsewhere. Native gold is obtained by the same process based on difference in density.

As the first metallurgists found the beds of copper and tin in a virgin state, they only had to deal with oxides, and it sufficed to smelt it in a reducing fire of charcoal to separate the metal. This is the metallurgical process still used in our own day, and, especially for tin, the Malays still use the primitive furnaces or smelting hearths.

The exploitation of both copper and tin mines was exceedingly simple; as the outcropping veins were still virgin, it was merely necessary to work, almost without effort, the vein of rock where it had been split by atmospheric agency, and to pick up the detached blocks among the fallen débris—and, in the case of tin, to wash the sand.

Cassiterite is always found in a siliceous gangue which flakes in the fire. As for the carbonates of copper, whether the gangue is calcareous or siliceous, it splits with the heat.

Fire was used from very early times for the disaggregation of rocks containing metals; we find traces of this process in all mining districts; the auriferous beds of Bohemia and Transylvania show thousands of examples of it. Further, since the driving of galleries for the extraction of flint was practised in neolithic times, we ought not to be surprised when we meet with real mines dating from the earliest days of the knowledge of metal.

Thus it needed only the chance of favouring circumstance for Man to discover the two metals which constitute the alloy that plays so great a part in prehistoric times. Since the

copper-bearing strata are much more widely spread over the surface of the globe than those bearing tin, copper was discovered first, contemporaneously with gold nuggets which sparkled among the sands and shelleets of streams.

If we indicate on a map of the world the chief locations

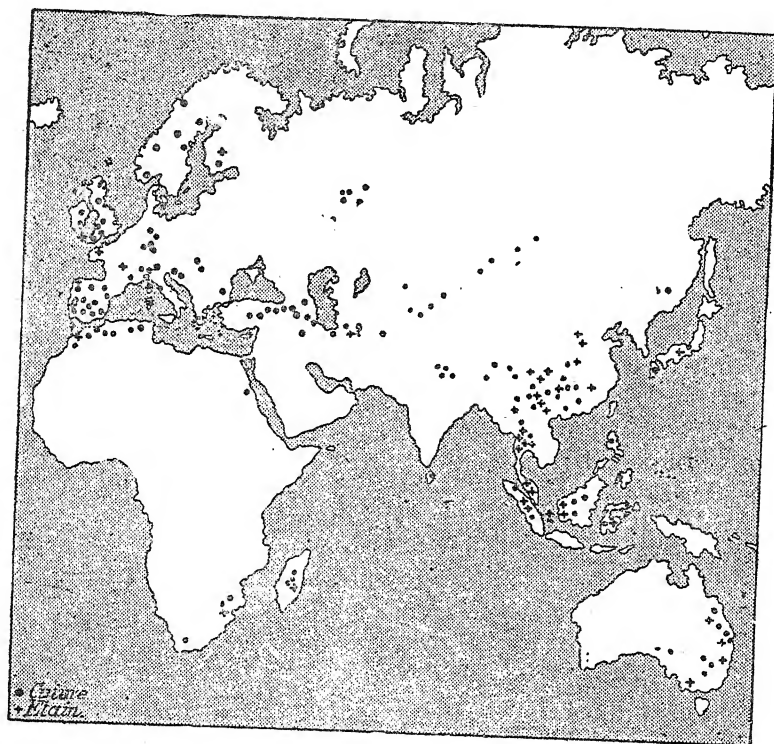


FIG. 51. Situation of copper and tin beds in the Old World.
(*Cuivre=copper; étain=tin.*)

of copper ore (Fig. 51), we see that this metal is of universal distribution; furthermore, it has been discovered in the New as well as in the Old World; South Africa and Australia, however, did not profit at an early date by their natural riches.

It is necessary, however, to distinguish between copper-producing regions which gained metallurgical knowledge from foreign sources, and those in which it may have originated. To begin with, the two Americas must be

ruled out; and we know by a great deal of archæological testimony that neither Algeria, Spain, France, the British Isles, Scandinavia, nor Central Europe saw the separation from its gangue of the first copper ingot. There remain then the Ægean Islands, Western Asia and Egypt; for we have seen that Chaldea need not be considered and that Egypt in all probability got the knowledge of copper from Asia.

As regards Egypt a legend was established, arising from an error made by the German savant Lepsius which still persists¹ relative to the richness of the copper mines of the Sinai Peninsula.² This archæologist, who was versed neither in mineralogy nor geology, took the natural beds of manganese ore of Serabout-el-Khadim for slag resulting from an intensive exploitation of supposed copper mines; and this gross error became law for those who alluded to Egypt. The strata forming the Sinai Peninsula cannot, by their geological constitution, contain considerable beds of copper ore, and the sole wealth of these mountains consists in the turquoises found in the sandstone. There exist genuine remains of a metallurgical industry at Wady Maghâra, but it dealt only with insignificant quantities of carbonated ore existing in isolated rounded masses in the sandstone adjacent to that in which turquoises are found. Egypt must be ruled out absolutely from among the copper-producing countries.

What countries remain in which the invention of metallurgy can have taken place? The Ægean Islands, Asia Minor, Transcaucasia, Armenia and Iran, on the one hand; the far eastern group on the other—it is quite certain, however, that metal is much more ancient in Chaldea and Elam than in Sino-Japanese and Indo-Chinese regions.

The Altai and the Pamirs are equally rich in copper; but the antiquity of metallurgy in these regions does not seem to go back very far. In all probability, then, it was in the north of Western Asia that this great discovery was made; thence, in a very rudimentary state, the knowledge would have gone down into Chaldea with the men who first came

¹ Cf. **XXVI**, II, 1st part, 176.

² Cf. **XXXIX**, 216 ff. All the documents relating to the question of the Sinai mines, brought together by the author, are in his collections at the Musée de Saint-Germain.

to settle in the island mud-flats of what was later to become the empire of Sargon the First and of Naram-Sin ; then it would have passed over to Egypt, the Phœnician coasts and the Ægean Islands, the centres whence the knowledge spread to Europe.

These are merely conjectures, but they rest on serious foundations—on a collective series of facts to which neither

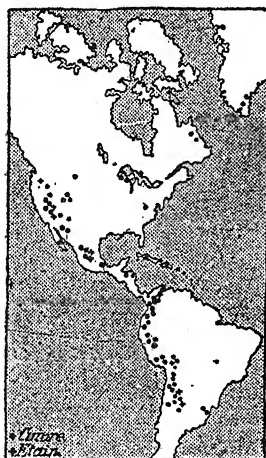


Fig. 52. Situation of copper and tin beds in the New World,
(*Cuivre*=copper; *étain*=tin.)

geology, Asiatic tradition, nor the earliest historical and archæological data offer any contradiction.

As regards tin the problem is still more difficult of solution, since the stanniferous areas are few¹. The rare deposits of tin known in Morocco, Western Spain, Auvergne, Brittany and Finland do not enter into consideration, and the same is true for those of England because of the distance of that country and its isolation in the middle of the ocean. Cassiterite is found, according to some authors, in the North-east of Persia, at Khorassan and in several districts of Armenia ; but I have not been able to verify this information. Madagascar, the Cape of Good Hope, and Australia must be ruled out from the list of countries where the discovery of the white metal could have been made. In North America, cassiterite appears (Fig. 52) on the coast of the Pacific

¹ Cf. XXXVIII, *Études archéol. et histor.*, 22, and map, pl. II (p. 34).

Ocean. In Mexico it produced a special bronze industry; it appears, finally, in South America, but we cannot consider the tin-bearing beds of the New World in a study relating to the old continents.

There remains only the Malay, Indo-Chinese and Chinese group, whose richness is great; maybe tin followed the same route taken by the great Mongolian invasions of the Middle Ages to reach our part of the world.

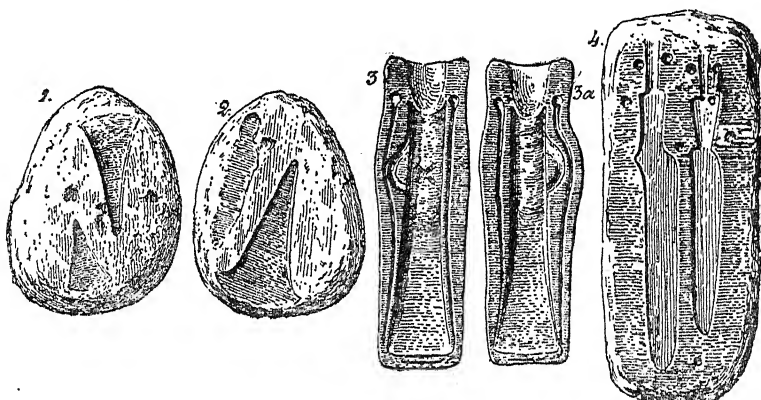


FIG. 53. Moulds. 1-2, Scotland, stone (Univalve); 3, Mould of hardened bronze (Lake Geneva); 4, Lac du Bourget (stone).

Indo-China and China were favoured by nature in a way that may well have been conducive to the discovery of bronze, because here cupriferous and stanniferous ores occur together in great abundance; but we must put a limit here to such considerations, and wait until Central Asia and China have been better explored. Perhaps we may even some day discover in the northern mountains of Western Asia stanniferous beds forgotten for thousands of years, and their presence would annihilate all the hypotheses we may be tempted to hazard to-day as to the location of the first centre of metallurgy.

Archæologists debate as to whether bronze was prepared by measuring out the proportions of the two elements (Fig. 53) in the metallic state¹, or whether the ores were mixed before being put in the furnace, and they explain by this last hypothesis the notable differences in the tin content

¹ Zeughelis, *Sur le bronze préhistorique*, *Mélanges Nicole*, Geneva, 1905.

of bronze. These are but conjectures which, before they can be supported, require that we should be able to study in the most minute detail a foundry incontestably of this period, and that we should be able to analyse the resultant slag.

We may add that if the Ancients did not use brass, that is to say the alloy of copper with zinc, although calamine was very abundant in Europe, it was because zinc burns on

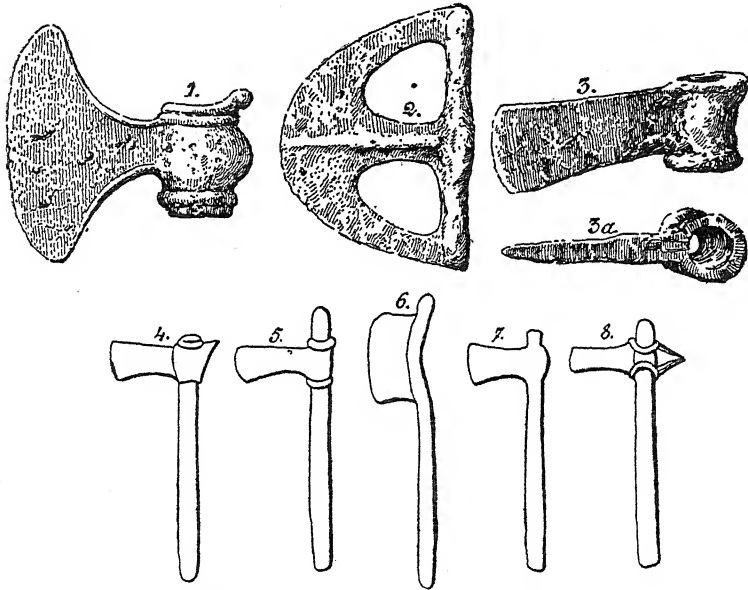


FIG. 54. 1-3, Bronze axe-heads (Susa); 4-8, after a bas-relief of Naram-Sin, found at Susa.

contact with the air when it becomes red-hot, even in an alloyed condition, and the metallurgical procedures of those days did not permit of its being treated always in a reducing atmosphere; tin on the contrary is very stable, either in the pure metallic state or in the form of an alloy. As for lead, its property of oxidation is the basis of the process of refining, of which the Ancients made such great use in historic times for the extraction of gold from quartz before the use of mercury came in.

Whatever may be the origin of the metals, we see in almost all countries the use of bronze succeeding that of pure copper; and it was only very gradually that neolithic stone implements disappeared. But just as the polished

stone industry is subdivided into regions, so is bronze fashioned in different manner according to time and place. The numerous human groups occupying the world at the time of the introduction of metal progressively accentuated their regional characteristics, but this is not the origin of nationalities, for they are much older than metal; it is, however, the definitive affirmation of clans, tribes, peoples and



FIG. 55. Bas-relief from the tomb of Mera (Sixth Dynasty), representing the working of precious metals.

empires. Both the powerful means of domination resulting from metallurgical knowledge, and the rapid progress made materially and intellectually, permitted certain peoples to attain the hegemony of their sphere of influence. History now begins, in Asia, Egypt and the Eastern Mediterranean, and gradually spreads in the areas surrounding the first centres of metallurgical knowledge; thus the modern world has its inception.

In Chaldea and Elam the bronze industry began at the same time as the use of writing (Fig. 54). From that time these countries enter the domain of History: nevertheless, this industrial phase characterized them for many centuries to come, until iron insensibly replaced brass in armament. The forms characteristic of these areas remained specialized for a very long time, and they have nothing in common with those in use among the still barbaric populations of the north. Under Naram-Sin, in the middle of the fourth millennium before our era, the lance, bow and axe were still the principal weapons of offence; the sword did not appear until much later, coming into current use in Assyria

only in the times of the kings of Assur, and, among the Greeks, with the Dorian invasion.

It was the same in the valley of the Nile (Fig. 55), where bronze remained in use for many purposes, parallel with the use of iron, up to the period of the Alexandrine conquest. Here also the archaic forms are specialized; they seem to have evolved from those of the worked stone implements (Fig. 57). In Syria (Fig. 58), and in the islands of the

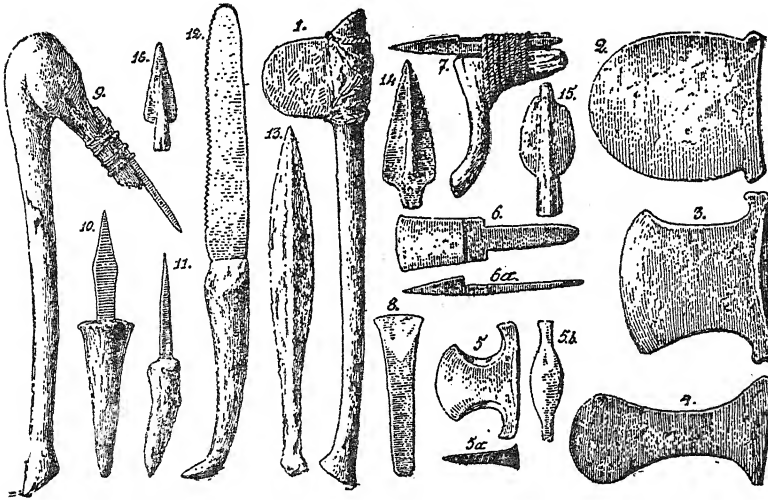


FIG. 56. Bronze implements of Pharaonic Egypt.

Eastern Mediterranean (Fig. 59), although Egyptian influence made itself felt occasionally, the forms in most cases are strongly individual.

Unfortunately we are but ill-informed as to the industries of the peoples of Western Asia other than the Chaldeans, the Elamites and the Assyrians. A very great number of different peoples jostled each other among the mountains and the high plateaux of the North. Except for the Urartians and the Hittites, they had no written character, and therefore the study of their culture belongs to prehistory. The Assyrian annals supply their names; but we are able but rarely to place their names with certainty on the map, and the districts in which they lived remain unexplored from the archaeological point of view.

Besides, if we may judge by the results of my own researches in the north-west of Iran and Transcaucasia which supplied almost all that we know about these regions, it is not in the Chaldean or Elamite industries that we shall find the origins of Nordic culture, but somewhere in the still un-

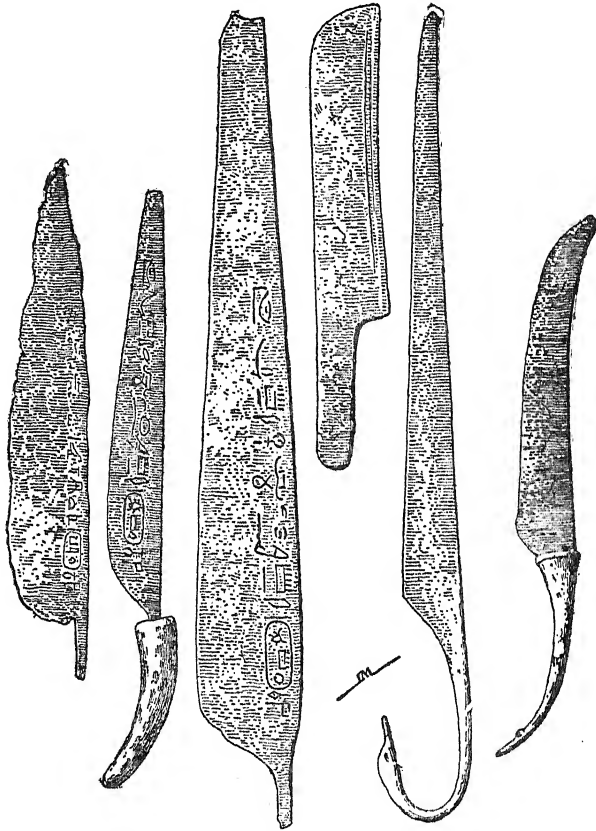


FIG. 57. Bronze implements, Egyptian New Empire (Cairo Museum).

known parts of Central Asia. The different bronze cultures whose traces we find in the dolmens of the Russian and Persian Talish are linked more or less closely with the civilizations of Central and Western Europe; in them we find that the dagger, the sword, the torque, incised pottery, and geometrical ornamentation are general. Except for animal and human representations, their predilections are largely

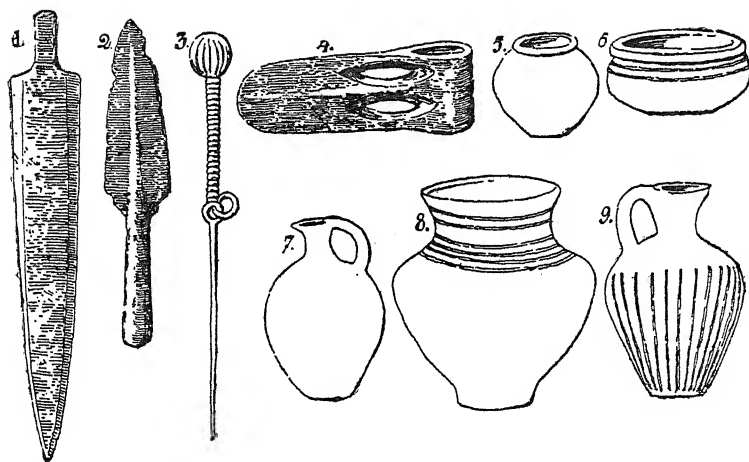


FIG. 58. Funerary Furniture from Tell and Tin (Syria) (Excavations of J. E. Gautier).

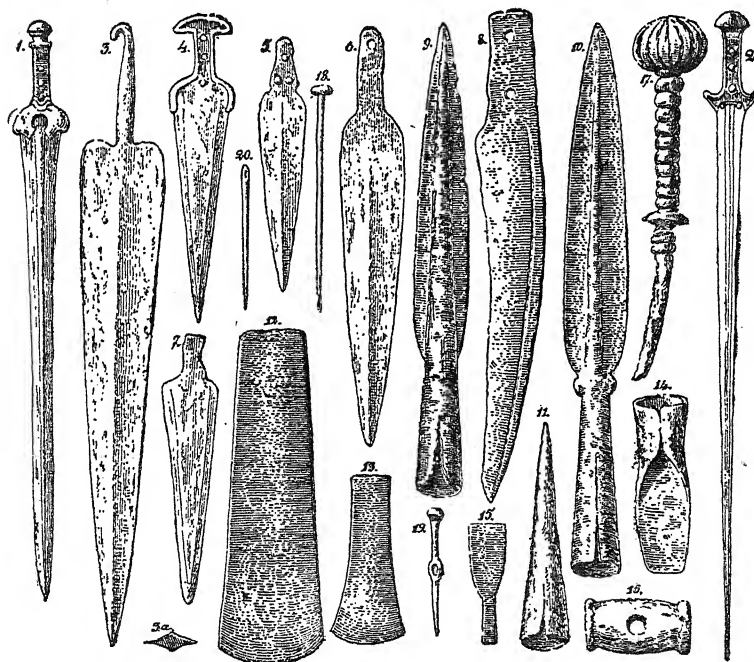


FIG. 59. Aegean-Mycenaean bronze implements and weapons.

characteristic of our neolithic populations of the West; it would seem that from before the days of polished stone a current of ideas and culture began to flow between the countries of Central Asia and those of Europe, that this current had not been affected to any great extent by the



FIG. 60. Western Europe. 1st and 2nd Bronze Industries.

southern centres of civilization in Western Asia, but that in passing from East to West it had borrowed ideas, in certain details, from Ægean civilization. It follows that by the time this flow of culture had reached our part of the world it could no longer be identical in its manifestations with those revealed in the funerary monuments of the southern shores of the Caspian.

The bronze industry of the Old World should thus be considered as regional and individual in development.

Chaldea and Elam—of which Assyria was the child,—Egypt and Crete, would seem to be the most ancient centres of the culture; then come the Nordic civilizations, all more or less closely interrelated, which covered the north of Western Asia and the whole of Europe, distributed over these vast

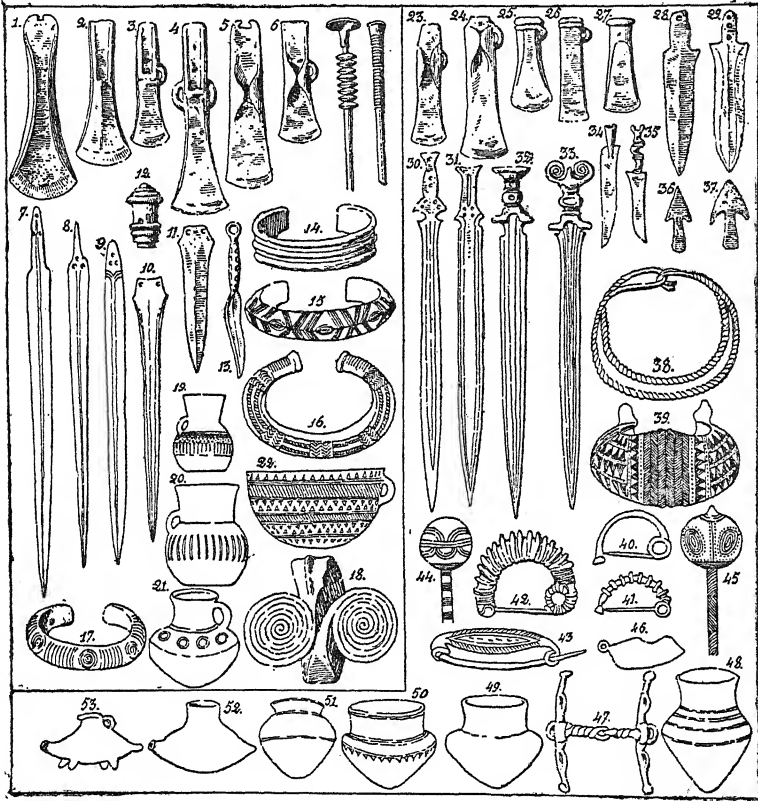


FIG. 61. Western Europe. 3rd and 4th Bronze industries.

regions according to time and place. Here the various peoples exhibited their individual genius, taste and tendencies while preserving the main outline and development of the Nordic bronze industry. Thus appeared at different periods the Caspian, Caucasian and Mycenæan industries, and those of the Russian Steppes, the Danube (Hungary), Scandinavia and Northern Germany, Gaul, Spain, Northern Italy, etc.; whilst in Mediterranean areas, the Minoan, Ægean, and even

Egyptian influences made themselves widely felt, whereas in northern lands they were less accentuated, or in any case were of later date.

In each northern district, whether in Europe or Asia, the bronze industry evolved locally, passing through successive phases. In the north of Persia and in Transcaucasia diff-

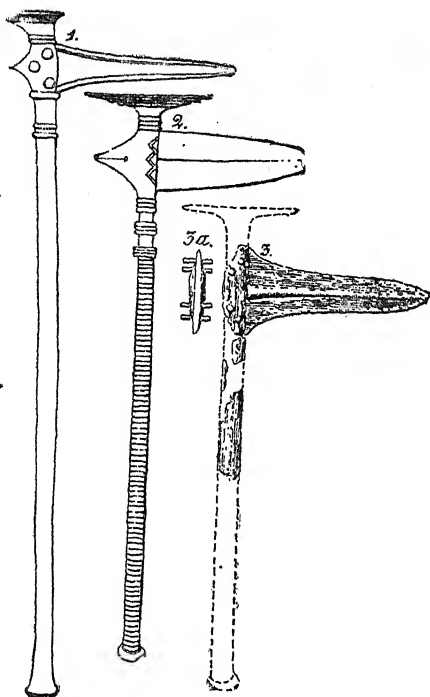


FIG. 62. Bronze Hatchets. 1-2, Germany; 3, Spain.

erent periods are easily distinguished by differences of detail in the local industry, and the same is true for all these districts under consideration.

In France, the form of the early bronze implement is usually inspired by that of the stone tool; then the sword appears on the scene, and later on comes into general use. With the sword came defensive armour, such as the helmet, the cuirass and the buckler, all of which had long been in use among the Orientals.

The fibula only appears in the West towards the fourth

bronze industry ; it was always unknown in Egypt, Chaldea, Elam and Assyria, whereas in the Hellenic world it was a familiar ornament from very ancient times.

In a book such as this there is not space to examine, one by one, all the objects of the bronze industry in order to investi-



FIG. 63. Bronze implements and weapons, Hungary. (From A. de Mortillet's *Musée préhistorique*.)

gate their relationship, or even their origin ; a study of that kind would take us far beyond the limits set to this volume, and would involve us in distinctions between the original form current among each people and those arrived at through contact with the inhabitants of neighbouring districts. It must suffice to say that in the bronze industry of our own regions we meet with many traces of mixed forms demonstrating the wide extent of the relations entertained between one people and another in that age.

It is difficult to be precise as to the date of the inception

of the bronze industry in different lands, and it differed in different localities. In Elam, Chaldea and Egypt, it would seem to be toward the end of the fifth millennium before our era ; in the Eastern Mediterranean it would be in the course of the third ; at Mycenæ about the same epoch ; in Gaul, somewhere about 2000 B.C., and in the north of Persia and the Caucasus probably a thousand years earlier ; but all these estimates are merely approximate, our documentation still being much too imperfect to enable us to establish chronology with any certainty.

CHAPTER VII

IRON INDUSTRIES

IN no country does the passage from a bronze to an iron industry occur suddenly. Arms and implements of bronze continued to be used long after the Hallstatt forms came in. It is quite usual to find both bronze and iron swords and daggers in tumuli. The forms themselves, however, were rapidly modified, and the superiority of the Hallstatt models being recognized, they were copied in copper alloys.

The weapons of offence consist of the long, slender sword, the dagger, lance and bow and arrow; the iron swords and daggers are remarkable for the shape of their hilts, which often have horns, and a conical pommel of characteristic appearance; the lance-heads and javelins are inspired by bronze types.

In the same way neolithic stone arrow-heads persist side by side with examples in bronze, the reason being that, at the beginning of the Hallstatt phase, iron, a metal still rare and precious, had to be economized. It was hardly ever used for anything other than side arms, such as swords and lances, which, being held in the hand, would not be lost.

By way of defensive armour, the cuirass, as in the days of bronze, is sometimes seen, but it is either of Greek or Italiote origin, or copied by the Celts from Mediterranean models. Further, the importation of utensils and weapons of southern manufacture had by this time become the object of a widely extended trade: *situlæ* of beaten copper, ceremonial baskets, and vases of all shapes are common in the Hallstattian necropolises of central Europe and Gaul. Some of these receptacles are even elaborately ornamented with designs cast in the piece or done in repoussé, and for the most part the motifs are those of Greece and Italy. Along with these objects are glass cups and vases of different shapes often ornamented with coloured bands, whose proven-

ance is beyond doubt. Gold is seen in the funerary furniture as well as in articles of adornment.

Tools and kitchen utensils soon reach a high degree of perfection and show by their development that the exigencies of life have become greater since the close of the bronze industry. We find saws, sculptors' chisels, curved knives, and others that fold inside the handle like those we use to-day. Bronze casseroles are common, and spits tied up in bundles are fairly frequent in Etruscan sepultures; andirons, and even spit-standards, were made, and among ritual implements the great meat-roasting forks should be mentioned.

Some of the burial mounds in several different European countries have yielded chariots,¹ usually with four iron wheels, and in other sepultures ploughshares have been seen. Bits and bridles for horses are frequent.

Personal ornaments of gold, bronze and iron are found in great variety; among them torques, necklets of beads made of coloured glass, amber, coral, ivory or mother-of-pearl; bracelets in many shapes, ear-rings, pendants, pins, fibulæ of every sort and kind, toilet-sets, amulets representing animals, usually horses which sometimes have riders; and finally, bronze belts of varying breadths, engraved or bearing designs in repoussé work. Almost all the metal jewelry is ornamented with finely engraved geometrical designs with which are often associated animal and human representations or religious symbols such as the solar disc, the wheel, the swastika and many others besides whose signification is still unknown.

The shape of the vases and the quantity of pottery found vary in different localities. The pottery is generally incised with geometrical designs associated with rude painting done over a glaze, but human and animal figures roughly done with straight strokes as in the Caucasian representations are also seen.

The classical Greek and Roman writers of antiquity speak of a Ligurian people, not very clearly differentiated, but the recollection of whom was a living thing throughout the Occident. These Ligures no doubt comprised all the old

¹ J. de Morgan, VII, 1921. I myself found a chariot in a Hallstattian tumulus in the forest of Moidons (Jura).

indigenous races of Western Europe, whose various groups had become absorbed into a foreign element and who, for the more judicious of modern authors,¹ are the hypothetical founders of neolithic civilization, and are thought to have taken part in those successive waves of Aryan-speaking peoples which have broken over Europe so often ;

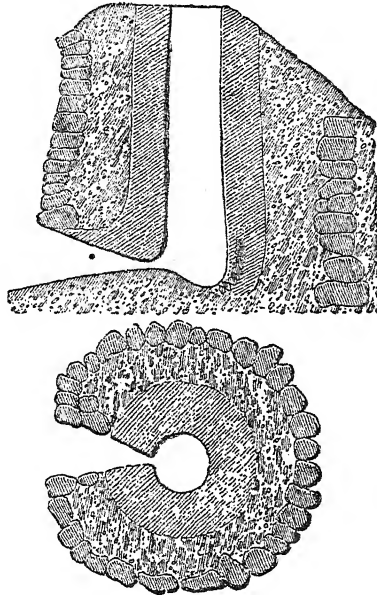


FIG. 64. Iron metallurgy. Ore furnace, Bernese Jura, after Quinquery.

the Ligures would have been the dolmen builders and perhaps also the first inhabitants of the pile-dwellings; but they would have become metallurgists, probably under external influence, at the same time as the skilled stone-workers.

We have shown how great is the uncertainty surrounding the genesis of metallurgy, and we have stated that in our opinion it is of oriental origin; in that case metal-working would have come among the Ligures, already long settled in the Occident, through some continental trade current, as well as by way of the Mediterranean. The Celts and the Dorians must have been the principal propagators of the iron industry. The ore itself, and the processes of

¹ Cf. **XXX**, I (1908), chap. IV, 110 ff.

working it, would have spread first, and the Ligures would have adapted its use to their needs and tastes; then would have followed the manufactured iron objects exported by the Hellenic world. This is probably the explanation of the dualism in artistic tendencies seen in the course of the bronze industry, a dualism which does not exist in the oriental dolmens of the north-west of Persia, and which is only found in these regions much later, when



FIG. 65. Blast-pipes of smelting furnaces. 1, Silesia; 2-3, Hungary.

Hellenic influence, through the Black Sea traders, penetrated among the peoples of Transcaucasia.

The so-called Ligurian period in our part of Europe is that of the foundation of cities, or, at any rate, it was during the bronze industry that there occurred the sedentary development of the settlements established by the neolithic people, as a result of the advent of agriculture and cattle-raising. Extended commercial relations followed. It was at this epoch that the Phocæans, drawn by the prospects of trade which hitherto had been carried on by stages, followed it to its source, and, landing in the country of the Ligures, founded Marseilles.

In those times also there were other barbaric groups of peoples—the Celts—living beyond the Rhine, and in distant islands at the edge of the world.¹ It is generally agreed that the Celts came from the east by the valley of the Danube.² Then these hordes would have gone up into the northern parts

¹ Ammianus Marcellinus (after Timagenes, XV, 9, 4).

² Cf. **XXX**, 227, note 2.

of Germany, toward the Baltic coast, and thence descended upon Belgium and Northern Gaul by sea and by land, driven from their domains by the tidal bore which submerged the Northern and Baltic coasts about 530 B.C. It is also about this time that the Iberians, coming from the Spanish peninsula, penetrated into the South of France.

The history of the exodus of the Celts from the Northern countries is known from a number of passages in the writings of antiquity; so we can leave them to occupy Gaul, having subdued, without destroying or driving out, the Ligures. It is of greater importance for us to find traces of them in more ancient times. There were Celts, or tribes closely related to the Celts which had remained in or returned to Thrace and Macedonia; it was they who, in 279 B.C., pillaged the temple of Delphi, and this indication is precious, since it allows us to link up the Celtic culture with civilizations still further east.

Déchelette is of opinion that "from their primitive domain," Central Europe and North-eastern France, the Celts spread into very distant territories during the first and second Iron Age, at the beginning of the third century—the period of their greatest expansion. Their domain would then have included the British Isles, the Iberian Peninsula, Gaul, North Italy, and the Rhine and Danube country up to the Black Sea; certain tribes would then have established themselves in Thrace; others again would have succeeded in firmly establishing settlements in the centre of Asia Minor (Phrygia and Cappadocia), and in Galatia¹ that of the Gallo-Phrygians.

This designation of their "primitive domain" seems to be extremely risky, and dictated by the reaction, which is the fashion to-day, against an oriental origin for the people of Aryan tongue. Our information, though incomplete, certainly shows us that there were Celts in the valley of the Lower Danube on the shores of the Black Sea; but it does not tell us whether they extended still further—to the Russian Steppes, nor if the Celtic peoples had lived there in earlier times.

Hoernes,² one of the best versed prehistorians of the

¹ XXVI, 572.

² LXX, 54.

Hallstatt civilization, bases his classification principally on the characteristics of the pottery and fibulæ. Without denying the great interest of these two elements, we would remark that the true characteristic of this culture is the introduction of naturalism into the geometric art; a characteristic distinguishing it clearly from the bronze civilization in Western and Central Europe, and which, both in its conception and its technique, removes it far from the Chaldean, Egyptian and Pre-Hellenic cultures, though allowing us to catch a glimpse of a certain distant relationship to Mycenæan taste.

However, the traces of the Hallstatt spirit are not limited to Europe; we find it far away in the north of Western Asia, to the south of the Caucasus, and in Caspian districts. A very different civilization from that of the oldest sepultures appears in Russian Armenia during the Iron industry, and this culture, though modified in a number of details, reappears both in Russian and Persian Talish and Ossethia, and even in Daghestan. It is characterized by its human and animal representations, of which both technique and style in all these places seem to derive entirely from the geometric style.

In Ossethia, this culture would not seem at that time to have used iron industrially, all the weapons being made of bronze; but this is apparent only, for the predominance of copper among the Ossetes is simply and solely the result of the near neighbourhood of rich mines of this metal. In Armenia the same culture comprises iron, silver and lead. The pottery in all three regions has the same technique of ornament—it is incised, often very carefully, and polished, and both in Armenia and Persia it presents animal shapes, something quite new in these parts.

If this industrial group and that of Hallstatt be closely compared, there are some striking analogies between them. Of course, in the Hallstatt culture it is necessary to leave out of account all Mediterranean influences, and to exclude their products—which is quite easy; the analogies then seen are so great that it is impossible not to connect these two industries and, in consequence, the people who were their authors. The geometric ornament on Bavarian vases is identical with that on the Lelwar and Helenendorf vases.

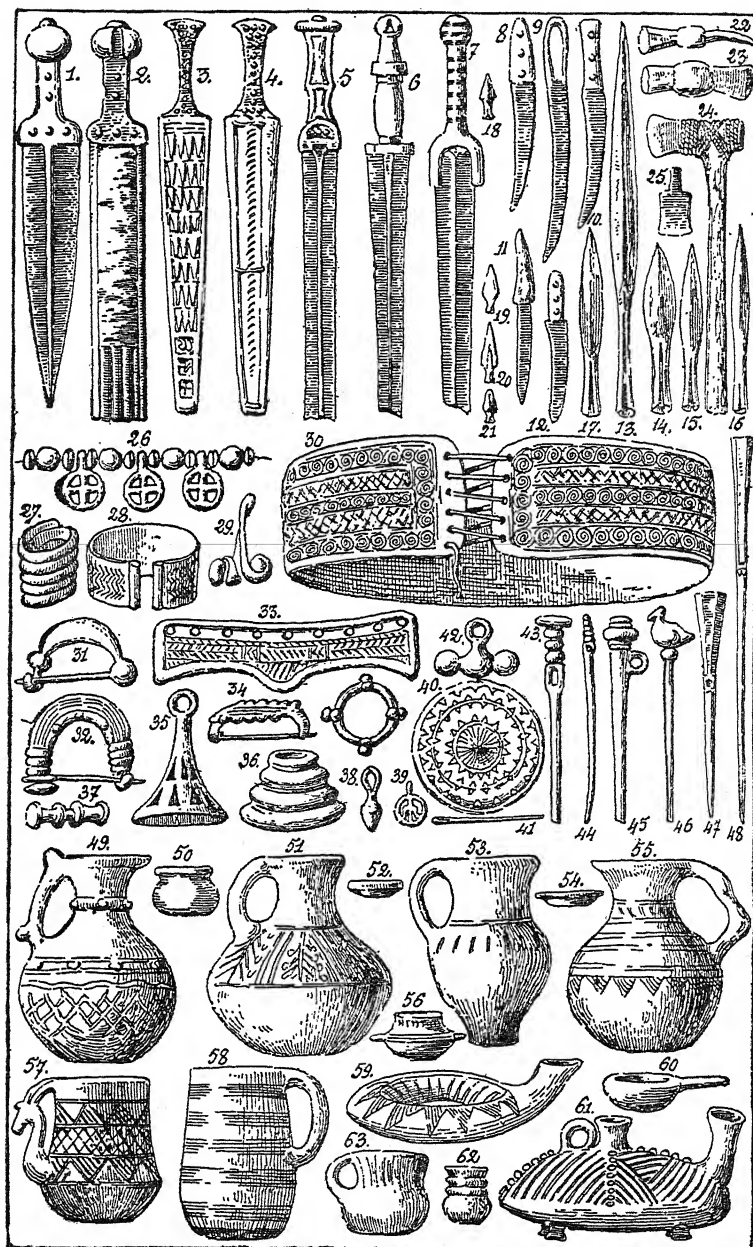


Fig. 66. Iron industry, Russian Armenia.

In the personal ornaments, our Hallstatt bracelets differ in no way from those of the East; the torques are the same, and so are the ear-rings, rings, pendants and fibulæ; we find also bronze belts, but most of ours are inspired by Etruria or Greece. The toilet-sets, the form of the weapons, the necessities of all sorts, the great bronze forks, all, if not the same, at least are analogous. Only the pins differ; but

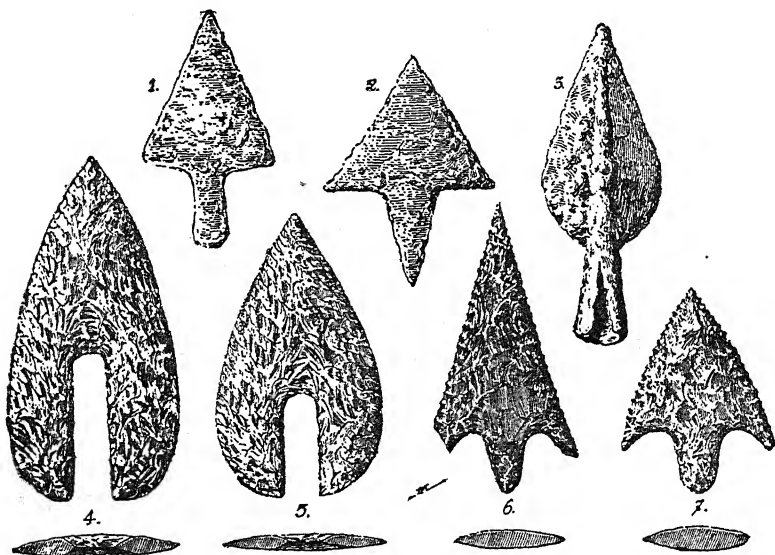


FIG. 67. Arrow-heads from iron industry sepulchres in northern Persia: 1-2, Bronze; 3, Iron; 4-5, Smoked transparent obsidian; 6, Red-veined obsidian; 7, Red jasper (Talish).

those of Lelwar are merely imitations adapted from the pins of the preceding iron industries in the same locality.

The method of burial is practically the same in both Orient and Occident; the body is extended (formerly it was doubled up) and is covered over with a heap of stones.

Iron, like bronze, made its appearance at different dates in different countries. In Chaldea, Elam and Egypt this metal was known from very ancient times; but in these regions the use of bronze remaining predominant, either for religious reasons, or more likely because iron in the natural state was rare in these parts of the ancient world, it becomes impossible to say precisely at what epoch iron became in-

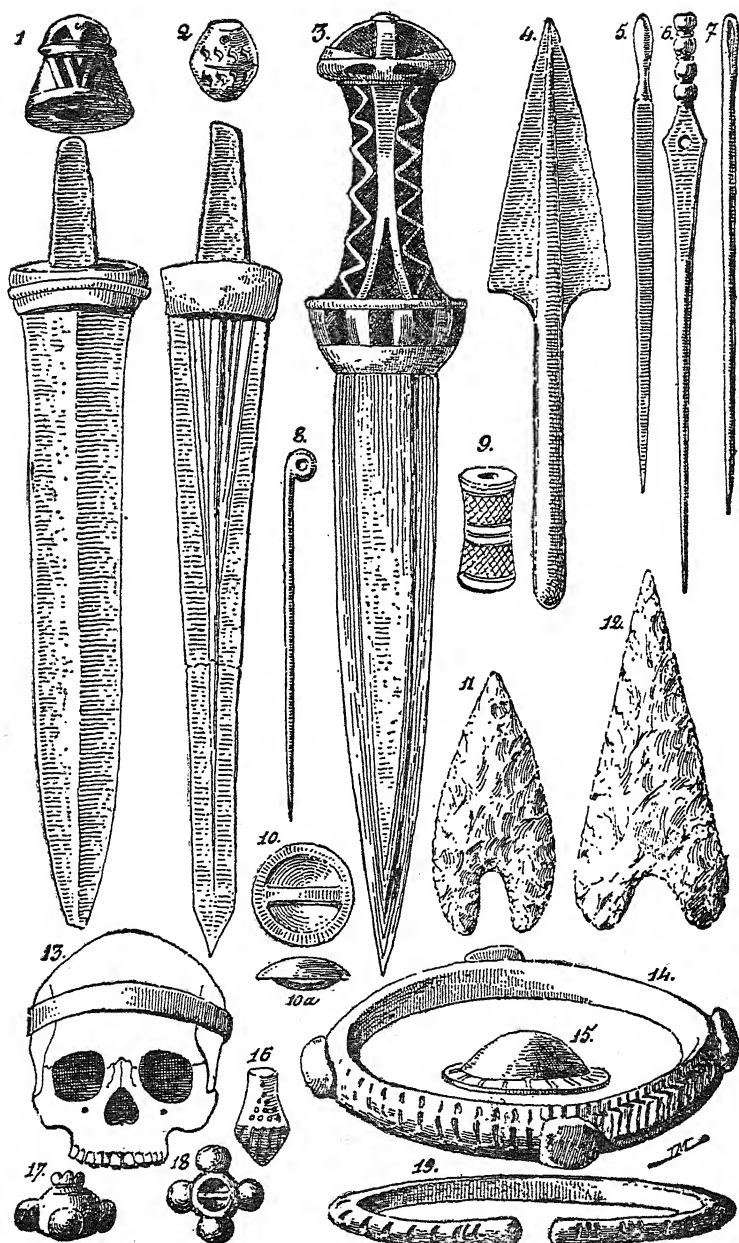


FIG. 68. Helenendorf (Transcaucasia).

dustrially used. It is otherwise where northern regions are concerned, whether in Asia or Europe.

In Transcaucasia, we distinguish two successive forms of the iron industry, very different in appearance and certainly belonging to different ethnic groups. The first, highly specialized, seems, on the whole, to be simply a continuation of the forms of the bronze culture of those parts; it is localized in the mountains of Armenia. The second, on the contrary, as we have seen, is that which appears to have been the parent of or sister to the Hallstatt culture of the West. And this culture itself, if we may judge by the funerary furniture, must have borrowed some details from the civilization which had preceded it in Transcaucasia.

In the West the second Caucasian culture alone finds an equivalent; but it is followed in our part of the world by another phase generally known as *La Tène*, from the name of the locality where it is best represented. The *La Tène* industry was that which characterized Gaul at the time of the Roman Conquest. It is strongly imbued with the Mediterranean spirit as well as with the northern taste of North Germany and Scandinavia, and does not seem to be, like the Hallstatt culture, of oriental origin.

At this period Hellenic and Italiote Culture become more and more important throughout Western and Central Europe; coins, Greek at first, then native but of Greek type, make their appearance, and history, properly speaking, begins.

Elsewhere, in the north of Russia and in Finland the use of iron succeeded directly that of polished stone. It was the same in Central Africa and on the Upper Nile, probably in more ancient times than in Europe. In India this progress seems to have been due to the Alexandrine conquest, or at least to have preceded it by very few centuries. We are unable to judge as yet of the evolution of the Far-eastern countries.

In the New World, in Oceania, in Polynesia, and among the tribes of Northern Siberia, the appearance of iron is quite recent, dating only from the discovery of these lands by explorers of our own times.

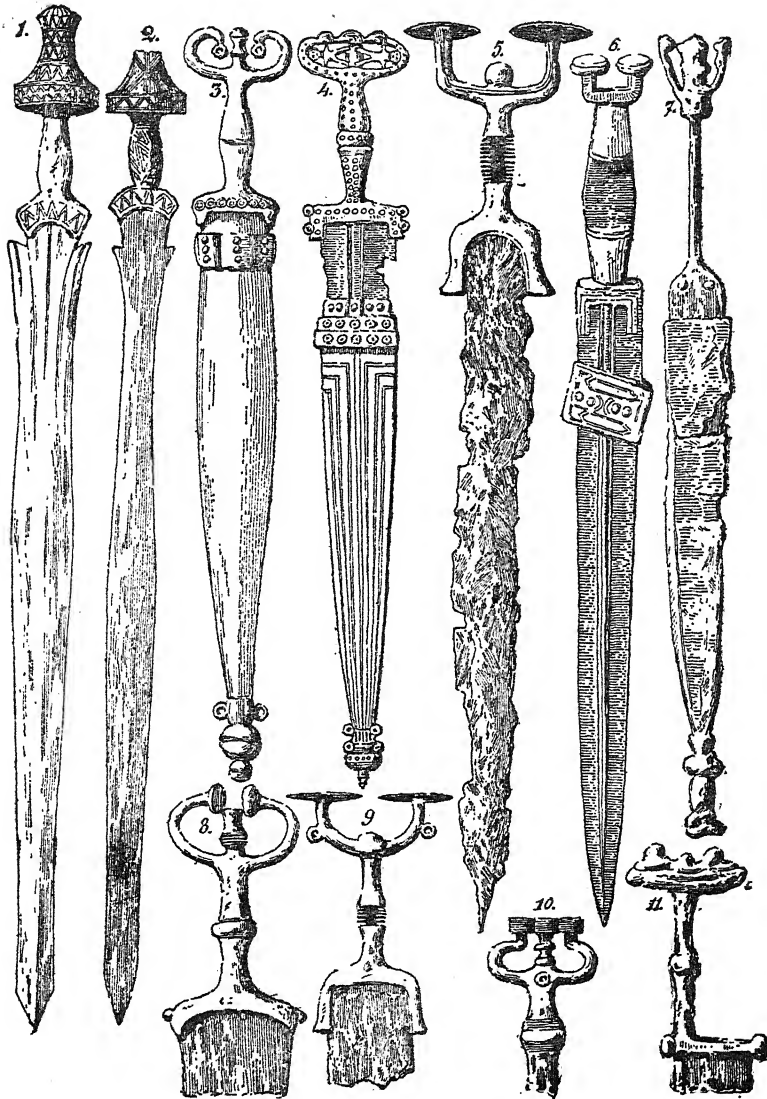


FIG. 69. Hallstatt type swords and daggers, Western Europe.

CHAPTER VIII

THE WORKING OF HARD ROCK

WE have seen that the most ancient products of human industry of which we have knowledge to-day are implements in chipped and flaked stone such as flint, quartzite, siliceous sandstone or quartz, according to which of these rocks occurred in the district, either in the outcropping geological strata or in the alluvium.

In every land and in every prehistoric age, flint has always been the favourite rock because it splits easily and the flakes thus obtained are very sharp-edged. Flint is a very resistant material, only to be blunted by blows on a hard body; thus it lends itself admirably to the method of chipping or knapping by percussion, and the flakes are rapidly chipped into shape either by light hammering or by pressure, for it suffices to apply an oblique pressure to the edge of a flint chip with a body of medium hardness to cause the splitting off of very small flakes, and by repeating this operation the implement can be shaped at will. The chipping instrument may be made of flint or any other stone of medium hardness, or even of wood, bone or horn, since a very light pressure is sufficient to knap flint in this manner.

Siliceous sandstone, quartzite, quartz and rock crystal of the same or greater hardness than flint, do not possess its special qualities, and split awkwardly, ill obeying the will of the workman. Consequently these rocks were at first used only when flint was unprocurable, and when relations between different peoples had been opened, it became an object of extensive trading.

Other materials, such as jade and obsidian, were also used, but jade is a very hard rock and can be chipped only with great difficulty by percussion, necessitating the pro-

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cess of wearing down by polishing; we meet with it only in the later neolithic industries, at a time when serpentine, diorite and other vein-rocks appear, the employment of which was unknown before Man applied to stone the process of polishing already long in use for ivory, bone and horn.

Obsidian, an ideal rock to chip, has the great disadvantage of being too fragile. This volcanic rock, however, has been much employed in prehistoric antiquity because for many uses it can take the place of flint, which never occurs in those districts where the volcanic rock is met with in the lava streams. This material was freely employed in Mexico, Japan, the Greek Islands of the Mediterranean, Transcaucasia and Armenia. It can be chipped in exactly the same way as flint, but it does not lend itself to polishing.

When a flint nucleus is struck obliquely with a hammer or a simple pebble of hard stone, a chip is flaked off whose virgin surface is slightly convex, and projects at the point where the stroke was made. This protuberance is known as "the bulb of percussion," and is to be seen in chips of all hard rocks. It leaves a corresponding cavity on the core. If, after chipping a certain number of flakes from the same side of the core, we strike it in the other direction, a very sharp though wavy edge is produced, whose alternating convexities and concavities can be reduced by further light knapping, till quite a regular cutting edge is achieved. These two methods belong to palæolithic industry, the Chellean type most often showing wavy edges, and the Acheulean presenting a nearly regular cutting edge. With the Moustierian industry the trimming becomes more highly finished in the "coups de poing"; but Man chiefly uses the chips whose edges he trims on one side only, either by percussion or pressure. We have seen that the "coup de poing" disappeared with the archæolithic industries, but the method of chipping both sides, as in that implement, is thenceforward applied to the chip; this results in the appearance of nuclei—cores from which flint blades are split off, eventually to be fashioned in a hundred different ways according to need, one or both sides being trimmed.

The mesolithic industry shows great progress as regards

variety of form ; there appear, among others, the paring-tool, precursor of the axe which, later on, will be polished ; but the paring-tool is generally chipped only on one side, the other remaining flat.

In Egypt and in India¹, this paring-tool appears in the

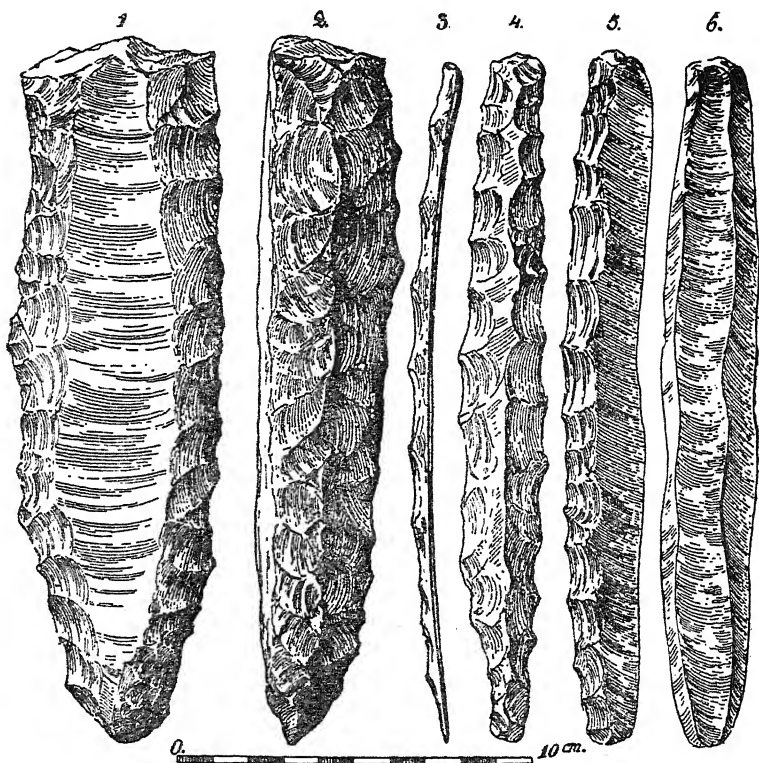


FIG. 70. Nos. 1-2, Nucleus (Grand-Pressigny). Nos. 3-4, 1st blade. No. 5, 2nd blade. No. 6, 2nd blade.

form of a true hatchet, concurrently with another disposition in which the implement is trimmed away on both sides ; the knapping being effected by blows skilfully struck on the side of the tool thus prepared. In the Egyptian paring-axe, however, the edge is often produced by a series of chips, which differentiates it from the true Campignian parer as well as from the corresponding Indian implement.

¹ Communicated by H. Seton Karr (Pénaar River).

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The polished axe appears in the neolithic industry along with a number of new forms, and its use continues during eneolithic industry, and even into the bronze phase, for metal was then still very rare, and for many purposes the old implements continued to be employed.

It is in neolithic and eneolithic industry that we meet with the masterpieces of flint-knapping, and it is hard to believe that craftsmen existed who were skilful enough to trim those large perfectly-executed Egyptian blades, always so fine,

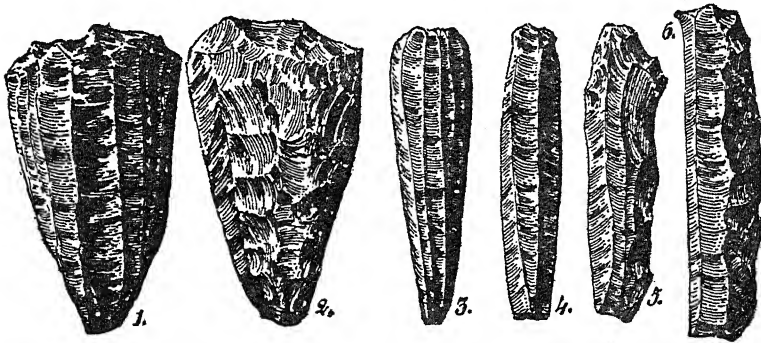


FIG 71. Nucleus and blades in obsidian (Phylacopi, Isle of Milos).

and sometimes polished on one side, that bear traces of chipping so regularly done as to be mathematical in its precision. The neolithic craftsmen in Egypt, as in Scandinavian countries, were past-masters in their art. Along the Nile valley they even fashioned light bracelets of flint, perfectly circular and polished on the outside. In Jutland and Scania they excelled in the manufacture of daggers. Some specimens found even in France are by no means negligible, but it remains to be proved that they are really indigenous, for at that time trade in flints had been greatly expanded.

In the north of Europe flint appears in large nodules in the upper cretaceous beds (from the lower green chalk to the white chalk inclusive); these nodules are especially formed in the chalk, after it is deposited, the silica collecting in the holes and hollows caused by the moulds of decomposed organisms buried in the mud. The sponges have been the principal agencies causing this concentration of silica. The finest flints in the world are found in the white

chalk of the south of England, the north of France, Belgium, the north of Germany, and Denmark. Flint-bearing chalk does not exist in Sweden.¹

In Algeria and Tunis flints are plentiful in the same formations as in Western Europe, whilst in Egypt they appear in the Tertiary (Nummulitic) beds; and, so far as concerns the low hills of the Nile Valley, the quality of the flint is in no way inferior to that of the West.

In order to feed trade and to supply flints to populations

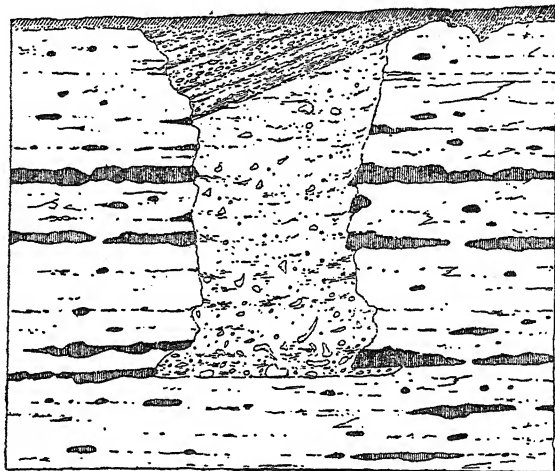


FIG. 72. Shafts for the extraction of flint at Mur-de-Barrez (Aveyron).
After Marcellin Boule (Mat. 1887, p. 8).

whose own territory yielded none, flint-knapping centres formed; such workshops were established in Belgium, in the basin of the Loire, and at Grand Pressigny. In this last locality very fine flint knives were made which were exported all over Western Europe, but other implements do not appear to have been made there to any large extent. The abandoned nuclei that had done the service required of them are found in the fields by thousands at Grand Pressigny among other places. These nuclei consist of longish pieces of flint that have had large chips flaked off them on every side, but one of which alone was prepared for the splitting off of blades.

¹ J. de Morgan, 1882. *Les terrains crétacés de la Scandinavie*, X.

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They are of varied dimensions ; some have a length of more than 50 centimetres (Fig. 70).

These great blades were split off by percussion, and very great skill and special precautions must have been required



FIG. 73. Topographical sketch of the flint mines of Wady el Sheikh (Egypt), from a survey by Seton Karr.

(*Mines préhistoriques*=prehistoric mines; *puits arabes*=Arab wells.)

to prevent the jar from breaking these long, thin, fragile knives. Of course we do find broken blades, but these are very few in relation to the enormous number of cores, and thus to the number of blades produced.

The chipping of obsidian blades was done in the same manner in the islands of the Eastern Mediterranean, but neither cores nor blades reached large dimensions ; the biggest nucleus never exceeding 20 centimetres in length (Fig. 71).

The outcropping flint having been exploited, the workers early thought of sinking shafts in the earth in their search for strata rich in flint. Further, the workers had probably recognized that this material was worked more easily in the fresh state when it retained the "quarry water" than if exposed for a long time to contact with air and weather.

It was in 1867 that the Belgian geologists¹ discovered

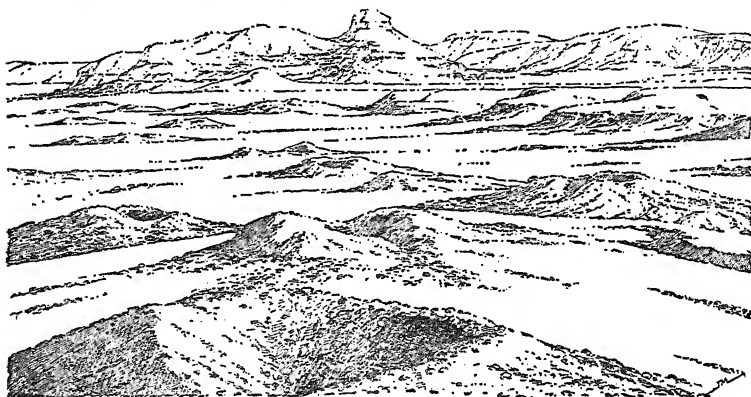


FIG. 74. Flint mines of Wady el Sheikh, after a photograph by H. W. Seton Karr.

the first of these curious mines at Spiennes, near Mons; and the same industry was recognized shortly after by Boule and Cartailhac² in Aveyron (Fig. 72), then in the department of the Oise,³ in the Marne,⁴ and in England in Norfolk and Sussex.⁵ Finally, in recent years, Seton Karr has discovered very large workings in Egypt (Figs. 73 and 74).

At Spiennes, the neolithic folk sunk shafts from 60 to 80 centimetres in diameter to a depth that sometimes reached 12 metres, through the Quaternary and Tertiary strata, then through the chalk till the bed of the best quality of flints was reached. At this depth they made irregular galleries in all directions 50 centimetres to 2 metres in height and 1 to 2.50 metres wide. In these galleries have been found picks of

¹ XLIV.

² V. 1887, 8.

³ Cf. Fouju, VI (1891), 445; *L'Homme* (1884), 447.

⁴ J. de Baye, V (1885), 464; XXII, 2nd edit., 64.

⁵ Canon Greenwell, XVII (1871), new series, II, 419; Colonel A. Lane-Fox (Gen. Pitt-Rivers), XVI, V, 1876.

deer-horn and flint, hammers and polished axe-heads, together with ashes and calcined wood ; and around these pits for

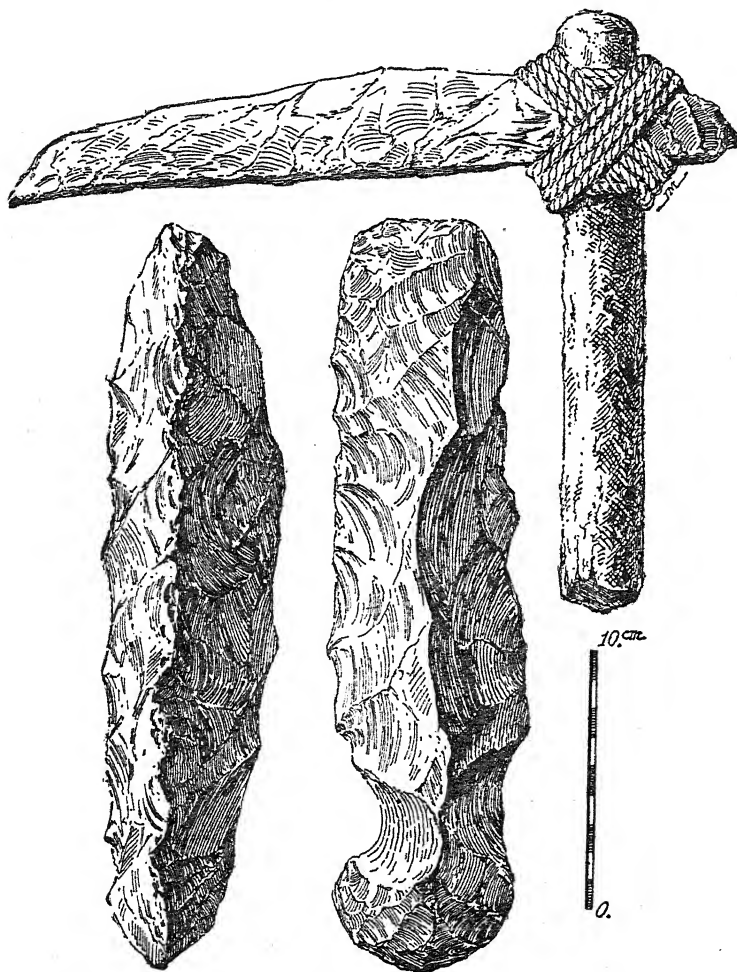


FIG. 75. Miner's pick from Wady el Sheikh (Musée de Saint-Germain, found by Seton Karr) and the method of its hafting.

about 25 hectares the ground is covered with flakes and rejected chips ; here, then, was the workshop.

This manner of exploiting the flint-bearing strata was certainly common in our part of the world ; but the soil covering the shafts having been cultivated for many a long

year, it is extremely difficult to recognize their position. In Egypt, the conditions are quite otherwise ; there the neolithic people opened up mines in the desert where the ground remains still in the state in which they left it more than six thousand years ago ; we still see the mounds of rubbish (Fig. 74) left by the work of the miners around the pits, and these heaps extend in infinite number along the edges of

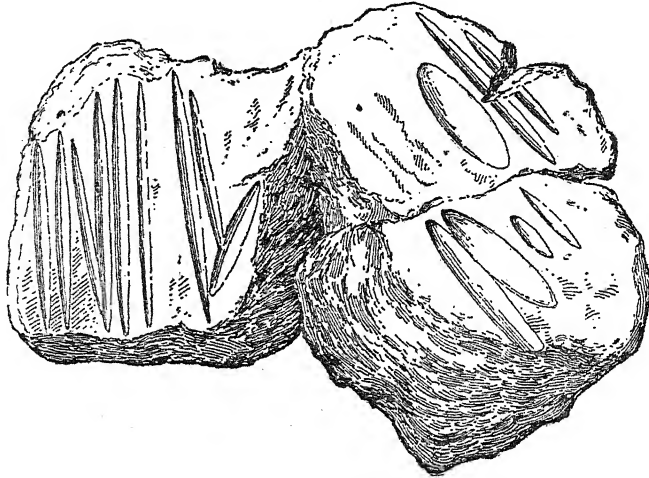


FIG. 76. The "Pierre aux dix doigts," Villemaure (Aube).

certain valleys known in those times for the rich flint-containing beds existing below the Quaternary drift. These extensive workings must have been contemporaneous with the flint-working industry of Egypt in its heyday ; that is to say that they probably commenced to be worked before the appearance of metal, and continued to be exploited under the kings whose remains repose in the necropoles of Nakadah and Abydos.

Long before he began to polish flint, sedimentary and crystalline rocks, Man had carved and polished bone and ivory, together with certain stone utensils ; he was not ignorant, then, of this method of treating his material, but for reasons that escape us, he did not employ it, and it was not till very late that he used it.

The implement, after being knapped with great care, took its final form before it was polished. For flint tools as much

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as possible of the too prominent ridges was taken off by minute trimming skilfully done; and for other rocks the implement was given its form by chipping it with a pointed hammer-stone of very hard rock; it was then ground by friction on some harder substance, and probably the projecting ridges of the concavities were taken off by the aid of sand and water.

This operation was carried out either on a rock or on a large stone brought into the encampment, and to which we give the name of rubbing-stone. We are familiar with

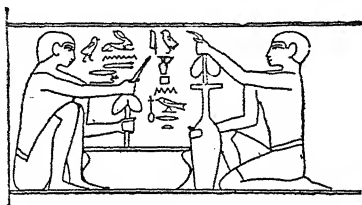


FIG. 77. Bas-relief of the Sixth Egyptian Dynasty.
Making stone vases.

rubbing-stones of the Aurignacian,¹ Magdalenian,² and Azilian³ industries; but these stones only served for the polishing of bone and ivory and for the making of needles and pins. Stone-polishing came in with the neolithic phase, and was applied only to a few implements, such as axes, adzes, gouges, chisels, and tomahawks throughout the world, and to knives and bracelets in Egypt alone; even then implements were often only polished at the edge. We should notice that in the south of Europe, in Italy, Greece and Spain, polished flint axe-heads do not occur,⁴ nor are they found in North Africa, or at least they are extremely rare.

The rubbing-stones are usually of hard sandstone; they are also known, however, in granite, quartzite, and other hard rocks. In the Dordogne slabs of flint⁵ were frequently used. One of the most remarkable is that known as the "Pierre aux dix doigts" (Fig. 76) from Villemaure in the Aube.⁶

But in addition to these immobile polishing-stones on

¹ Trilobite Cavern.

³ Mas-d'Azil Cavern.

⁵ Dr Testut, *V* (1888), 77.

⁶ A. de Mortillet, *Les polissoirs de Villemaure (Aube)*, *IX* (1906), 44, Figs. 26 and 27.

² Combarelles Cavern.

⁴ *XXVI*, I, 512.

which the implement to be finished was rubbed, there are a good number of hand polishers and sharpeners which certainly were not intended for polishing stone tools, but must have been used for bone, ivory or horn. We find them in great numbers in neolithic stations; some even are holed and could be hung at the belt.

The neolithic industry at its zenith included implements that were perforated to receive handles, such as axe-heads, hammers, clubs, tomahawks, etc., found all over the world. These weapons are almost always made of very hard stone, such as diorite, serpentine, etc., and were in use a long time,

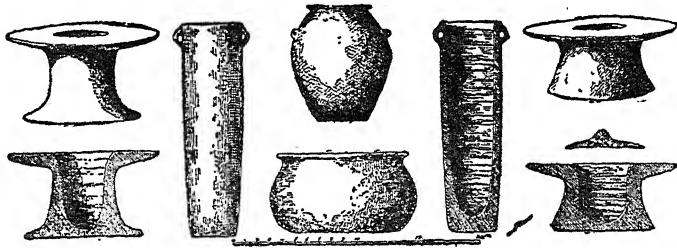


FIG. 78. 1 to 5, Stone vases. El Amrah (Upper Egypt).

for we find them frequently with bronze implements; but we should be quite wrong in considering them to be representative of an epoch¹ for eneolithic industry cannot be considered of the same antiquity in all the widely different regions where they are found. In Egypt and Chaldea, maces of various shapes are extremely ancient and their use is preserved up to our times in Mesopotamia. The tribal Arabs, in fact, are still armed with an instrument consisting of a short stick furnished at one of its extremities with a large ball of bitumen.

The boring of the hole for hafting was done as it still is in our days by the rotation of a circular drill, generally hollow, worked either by hand or by the aid of a string bow, operating on the stone to be pierced; wet sand played a great part in this work which also permitted vases in hard stone, such as rock crystal, obsidian, cornelian, etc., to be hollowed out. Certain bas-reliefs of the old Kingdom in Egypt show us labourers occupied in this work (Fig. 77).

From the times of the chipped stone industry, Man had

¹ As does Déchelette, **XXVI**, I, 519.

worked in wood ; in the closing periods, those which preceded the appearance of metal, he cut down great trees whose trunks he hollowed to make pirogues,¹ a sort of elongated trough, rounded or square at either end. He also cut and trimmed



FIG. 79. Stone vase. Abou Zedan (Upper Egypt). Eneolithic. H. de Morgan's researches.

to a point the piles of his lake villages and the beams of his houses. This work certainly required patience, as we ourselves know, having seen the Indians of South America engaged in it ; still they achieved their objects, just as well as if they had had metal axes. Time was the principal factor in all this work, as it still is among primitive peoples ; the Indians of Alaska polish walrus ivory by rubbing it for weeks and months in the hollow of their hands and thus obtain a lustre that a more rapid process could never produce.

¹ Moringen and Robenhausen (Switzerland), Saint-Aubin-en-Charollais (Saône-et-Loire), etc.

PART TWO

THE DAILY LIFE
OF PREHISTORIC MAN

PART TWO

THE DAILY LIFE OF PREHISTORIC MAN

CHAPTER I

HIS DWELLING-PLACE

WE know nothing of Man's dwellings earlier than the evidences of Moustierian industry. The caverns, however, were open to him, for in most of them, we find, at the lowest level of the deposits silting them up, remains bearing witness to their occupation by wild animals. Hence we are led to believe either that the country was not inhabited before the coming of the Moustierians, or else, as we have said earlier, that the Chellean and Acheulean industries were contemporaneous with the Moustierian, that they responded to needs that the troglodyte population did not experience, and that the Chelleans and Acheuleans built themselves huts in districts where there was no natural shelter. It is impossible, in fact, not to believe that these people would take shelter in caves if such were at their disposal.

The caverns, preserving, as they have done, traces of succeeding generations inhabiting them, furnish the most precise information as to the life of palæolithic and archæolithic Man. In the Grimaldi caves (grotte des Enfants) the deposits that filled them had accumulated before the excavations to a depth of about ten metres. The lowest layer contained hyæna coprolites, and above it there were superposed nine distinct floor levels, all Quaternary. The lower layers were characterized by the presence of bone fragments of *Rhinoceros mercki*;¹ nor do the Grimaldi caves constitute an isolated example, for all our caverns have been inhabited in the same manner, more or less consecutively. Some, however, provi-

¹ Cf. **LXIV**: *Historique et description*, by the Chanoine de Villeneuve; *Anthropologie*, by Dr Verneau, *Géologie et Paléontologie*, by Marcellin Boule.

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sionally abandoned by Man, once more became the haunt of carnivores; then they were reconquered, and floors yielding evidences of habitation succeed the sterile layers in which the products of industry are absent.

We really know nothing whatever of the dwelling-places of men other than caves during Quaternary times; the first traces of huts built in the open appear with mesolithic industries. The Danish kitchen middens and the Campignian stations reveal to us that Man was then constructing shelters of interlaced branches daubed with mud and clay. As a rule these huts were grouped in villages, and were usually protected by natural means or by palisading. These primitive houses were low, circular, and at most 2.50 metres in diameter. In certain cases, one hut would be used for habitation, and another as kitchen.¹ Usually these villages were situated near running water; for we must not forget that, although occupied in cattle-raising and cereal culture, the mesolithic and neolithic populations still depended on hunting and fishing for a large part of their subsistence. A good many of these settlements were in the neighbourhood of the more important beds of flint or of obsidian, and, later, of metal ore, leading to the establishment of veritable manufactories catering for export trade. The land had to support these groups, which, being small, easily produced all that was needed in the vicinity of the villages.

The manner of their life in those days did not, as a rule, lead men to build actual cities, although certain agglomerations may be dignified by the name of towns, such as the Camp de Chasse, in the Côte-d'Or, covering no less than a dozen hectares, and that at Campigny (Seine-Inférieure), where the huts spread over three or four square hectometres. Further down the river, in the valley of the Bresle near the village of Incheville, there was a Campignian encampment on a plateau, probably fortified; this camp measures several hundreds of metres in length. We may further mention the townships of Catenoy (Oise); Camp-Barbet, at Janville, in the same department; and Peu-Richard, in the commune of Thénac, Charente-Inférieure.

The manufactories of stone implements varied in kind

¹ Rollain, *Habitations néolithiques du plateau des Hautes Bruyères (Villejuif)*, I (1899), 204.

according to the nature of the soil and the demand for exportation. In many localities weapons and tools of every shape and form were fashioned, whilst in others only certain types were produced. In Normandy and Champagne they polished axe-heads; in Calvados and Seine, they chipped scrapers. Grand Pressigny, we have seen, was a centre for the manufacture of large flint blades.

But it is not only in France that we find remains of human settlements of the latter portion of the Stone Age. In the province of Liège, in Belgium, there are traces of numerous villages of this period.¹ In Italy interesting discoveries have been made in the Abruzzi, in the province of Reggio, and in the provinces of Mantua, Brescia, etc.²

What we know of the huts of Germany shows us that the manners and customs responsible for the mode of their construction differed from those of the inhabitants of France. The German huts were rectangular, constructed on a framework filled in with trellised branches plastered with pisé which was decorated with geometric designs in various colours.³ In Bohemia, Hungary, Bosnia, Transylvania, and as far as Roumania, traces of neolithic villages have been discovered; but if we compare these discoveries, we note perceptible differences, either in the construction of the shelters, or else in the pottery or stone tools, though the underlying principles are the same.

It is very difficult to distinguish between neolithic dwellings and those of peoples who knew the use of metal; tastes differed according to locality and the various materials at Man's disposal. Further, the date of these dwellings can only be determined by the objects found among their ruins. The houses of Megasa and Phæstos, considered by Dawkins and Mosso to be neolithic, are, without the slightest doubt, eneolithic from the evidence of the objects they contain as much as from their method of construction. In the same way the constructions at Orchomenos, with stone sub-foundations and walls of unbaked bricks, belong to an already well-advanced civilization, in which metal was certainly known. Schliemann wrongly attributes them to neolithic culture.

¹ Cf. Marcel de Puydt, **II** (1888 to 1903).

² Cf. Pigorini, **XXI** (1875), 175.

³ Cf. **LXXIV**.

Europe at that time was peopled by tribes belonging to diverse races of very different manners. Variations in customs, which were to make themselves felt still more after the appearance of metals, are the best proofs of this.

In the fertile plains and valleys where game was abundant Man had to be on his guard not only against wild animals but also against his neighbours; conflicts between tribes were incessant in those days, as they still are to-day among nomads, either for the possession of hunting and fishing grounds, or for pasturage and agricultural land. Security was only relative. Do we not well know that before they were practically annihilated by the Europeans, the Indians of the United States were constantly at war one with another? Thus we see nearly all neolithic villages surrounded by defensive walls. Unfortunately, since these sites continued to be inhabited long after the appearance of metal, it is impossible to attribute to neolithic people with any certainty the fortifications whose remains we recognize.

Constantly in search of more favourable conditions of existence, the neolithic populations of the lake regions sought refuge from their enemies by building their dwellings on the water. In spite of the rudimentary means at their disposal, these men felled the forest trees and made them into piles, which they drove into the mud of the lakes; on these piles they constructed more or less broad platforms on which they built their houses. This procedure, unknown in France before the appearance of polished stone, is still in use in both the Far East and in Oceania. The bay of Singapore affords a striking example: there an entire Chinese settlement, consisting largely of fishermen, still lives thus on the water.

We can enumerate in Switzerland to-day over two hundred pile villages.¹ Stations of this kind are common in our French Alpine lakes, and they are found from the Jura to Scotland, and in Russia.

Elsewhere construction on piles is not limited to dwellings built over water. Throughout Malaysia the houses are built on piles, and their platforms are raised several metres above the ground; it is thus that the natives protect themselves

¹ LXVIII.

from marsh mists and dangerous animals. The terramaras of North Italy were constructed on the same principle.¹

The construction of the crannogs of Ireland and Scotland spring from the same idea, but the same principle of defence by water developed on different lines from those of the palafittes. Crannogs are small artificial islands produced by the building up of shallows, which are under water in winter and are dry in summer.

It can be readily understood that the inhabitants of the palafittes threw their daily refuse into the water and that very often useful objects fell in by mistake. Thus from the forest of stakes still standing in the mud and marking the position of these villages, the drag brings up the various household and personal articles of those times; stone, metal, trimmed bone and wooden implements, pottery, even pieces of cloth, nets and ropes preserved by the peat, pirogues hollowed from tree trunks, nuts and berries—in short, everything which in those days had a place in the everyday existence of the inhabitants. Thanks to these many relics we have a thousand and one details of information on the intimate life of the lake village populations.

The piles which have stood in place for so many centuries permit us to estimate the size of the various settlements and to determine their plan and shape.

At Robenhausen (in Switzerland) on Lake Pfäffikon the area occupied by the village was nearly a hectare and a half and it stood about three thousand paces from the shore of the lake. A long bridge connected the village with the mainland.

The ancient method of constructing human habitations persisted in our part of the world long after the appearance of metals; Roman bas-reliefs, particularly those on the column of Trajan, supply some very conclusive representations in this regard; and some of the funerary urns from Etruria and Latium (Fig. 80) give us an exact reproduction of the huts of those days in those countries. It was only much later that Man thought of constructing walls for his dwellings; his first care was to use stone in order to preserve the bones of his dead; it was only long afterwards that he took pains to protect his own life by raising up ramparts for

¹ Cf. O. Montelius, after L. Pigorini, *Civ. prim. Ital.*

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defence. Nevertheless, we should note that in the Eastern Mediterranean the local populations had built the walls of their houses of dry stone ever since the coming in of neolithic industry ; and that in Asia they made use of clay briquettes of different sizes for prehistoric ramparts, at Susa amongst other places, and that this method of construction was rapidly transformed in Egypt, developing into the brick-work of which the tombs of the Thinite dynasties were built ;

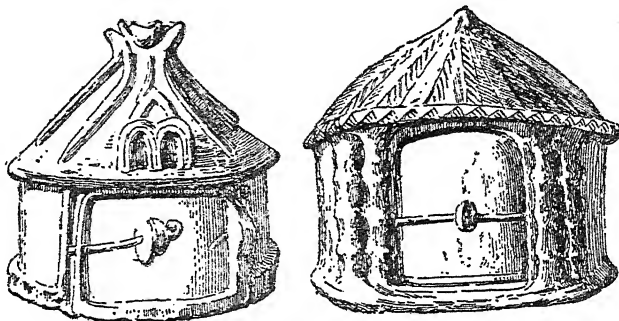


FIG. 80. Hut-shaped funerary urns (Etruria).

the royal tombs of Nakadah and Abydos are built of unbaked brick. A little later they even used these materials in the construction of ramparts for the protection of their towns. The walls of El Kab are an excellent example of primitive military architecture. Later still, under the twelfth dynasty, the pyramids of the Usertesens and Amenemhats still consisted of a huge core of unbaked brick, faced with stone ; and, many centuries after, under the Achæmenidæ of Persia, everything was built of large unbaked bricks—houses, palaces and ramparts, although baked brick had been known at least since the time of the Patesis of Elam. In Gaul, in Greece, throughout Europe, and even in Egypt, baked brick only appears and comes into current use at the time of the Roman conquest.

The nomads of our times live in tents, shelters made of skins or of a coarse haircloth, which they pack on their animals as soon as the pasturage is exhausted around their encampments ; for they stay only a few weeks in one place. It was no doubt thus in prehistoric times ; the nomadic hunters or herdsmen packed up their tents and departed,

either when the game was exhausted, or the grass all consumed by the flocks. These constant changes of site leave no durable record; in a few days rain and wind scatter the ashes of the camp fires, so that only a few semi-calcined stones and occasional forgotten or abandoned objects remain on the ground. Thus may be explained the discovery, in all countries, of innumerable isolated objects whose presence cannot be corroborated by similar finds.

Prehistoric settlements differ much in size in different countries; we have seen that the palafitte of Robenhausen measured about one and a half hectares superficies. These proportions reappear in several primitive cities; at Murcens (Lot), and at Mont Beuvray (Saône-et-Loire) the dimensions of the town or citadel are equal to those of Robenhausen. Alesia (Côte-d'Or) occupied an area of 9700 ares;¹ Gergovia 7000 ares; and Palatine Rome covered 1320 ares; while Tiryns was only 200 ares, Athens 250, and Mycenæ 300 in extent.

It is to be noted that the custom of settling on high ground and of constructing an acropolis surrounded by walls seems to have been brought in by peoples coming from Siberia, for all the great towns founded by the old stock are in valleys on the banks of rivers. Thebes, Abydos, Memphis, Ur, Uruk, Babylon and Susa, are situated in the plains; whereas Rome, Athens, Ecbatana, Alesia and many other towns and villages founded by the new-comers (Aryans) have an acropolis, or are entirely built on heights. In Gaul there are innumerable examples of the choice of heights. The occupation of islands and the construction of lake cities and crannogs is due to the same need of natural protection for the settlement.

¹ An are equals 119'6046 sq. yards.

CHAPTER II

HUNTING, FISHING, ANIMAL DOMESTICATION AND AGRICULTURE

Hunting.—Primitive peoples to-day, as in the past, are dependent on hunting, fishing, and the gathering of wild plants and berries for their subsistence, and it was thus in the oldest prehistoric phases. The débris met with in the drift yields no information on this point about the life of the men who chipped the Chellean and Acheulean "coups de poing". In the Moustierian levels of the caverns, however, the numberless fragments of bones of wild animals then inhabiting the plains, valleys and mountains, leave no doubt as to the doings of the troglodytes. They were hunters, and no doubt fishermen also; the capture of game and fish was their principal occupation.

Life, however, was not so easy as might be thought, for throughout Quaternary times Man had to measure his strength against terrible adversaries, no matter whether he struggled with them for his subsistence or to defend his own life. It was certainly not by his rude flint weapons alone that he was able to master the pachyderms, rhinoceroses, bisons, and other great herbivores on whose flesh he lived, nor that he vanquished, as he did, even bears and lions. Undoubtedly, he made great use of snares and traps, like many modern savages, and of pits such as are still used in Indo-China to capture the royal tiger, and he must also have made formidable weapons, such as spears, of hard wood, perhaps with poisoned points. A boxwood or oaken stave, properly prepared, becomes a most formidable means of attack in the hands of a skilful and vigorous man.

Among modern savages this kind of weapon is frequently used, and varies in shape and design according to the use intended. Pikes, javelins, and spears pointed with flint,

bone or horn, or merely tapered, are the principal hunting weapons of primitive men, and in prehistoric times as in our own day they could be turned against man just as well as against wild beasts.

The bow and arrow certainly appeared in our part of the world before the advent of neolithic industry, and was a great improvement on the throwing-stick, for the projectile could cover great distances—four or five hundred metres, (in the Roman epoch), making it possible to hit

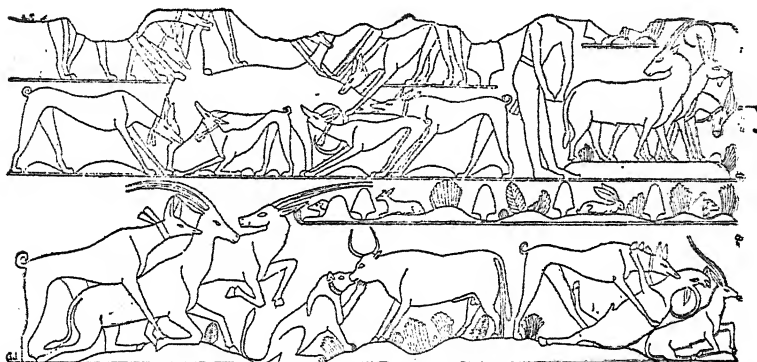


Fig. 81. Hunting scene. Bas-relief from the tomb of Mera, at Sakkarah (Sixth Dynasty).

an enemy or game without giving the alarm. Thenceforward men could fight against lions and bears with less risk of life than in the past. In hot countries, however, the hunter had not only to deal with the great carnivores: in Egypt, crocodiles coming out of the marshes by night entered villages in search of prey, just as alligators do to this day in Central America, and neither arrow nor spear would have the least effect on their armour. These monsters sometimes attained enormous dimensions, and while the inhabitants sought refuge within their palisades, and dared not venture forth, lions would leave their desert haunts and prowl around the huts and the cattle enclosures. In Chaldea the memory of such conflicts with the king of beasts was kept alive for centuries, as the carvings and sculpture bear witness, whereas Egyptian bas-reliefs of the earliest historic period for the most part (Fig. 81) demonstrate more pacific exploits of the chase, such as gazelle and

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antelope hunts, or water-fowl hunting in the marshes. Archery and netting play a great part in these hunts.

In the kitchen middens of Egypt and Europe and in the caves considerable heaps of broken bones are found, remains of meals that the men of those days did not trouble to move far from their dwellings; this débris varies at different periods, thus providing for each a list of the wild animals Man used for food. At Solutré there have been found the remains of no less than one hundred thousand horses, whose bones had been heaped up around the ancient

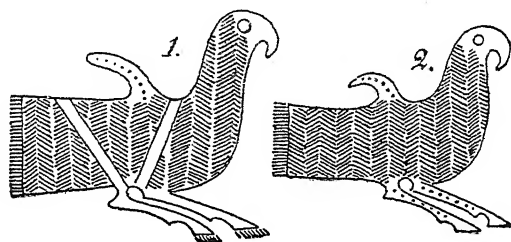


FIG. 82. Hunting falcons: 1, jessed; 2, free. Russian Armenia. Second Iron Industry.

dwelling-places. Whereas in regions outside Europe we see rock drawings of men in pursuit of game, such representations are non-existent with us in Quaternary times, though our caves are covered with paintings. They occur later only, contemporaneously with neolithic industry. This observation has a significant bearing on the spirit in which the Magdalenian representations were done.

The general introduction of cattle raising and agriculture did not put a stop to hunting, but thenceforward the taking of game, no longer indispensable to existence, became a secondary occupation. It would appear that the neolithic people lived as much on wild animals as on their herds, if we may judge by the fragments of bones found in the mud beneath the lake villages. It was not till much later—in historic times—that hunting became an agreeable pastime, a luxury that the greatest kings did not scorn. With the advent of metals, however, weapons became more formidable, game grew scarce, and a number of species disappeared. It was thus that the Roman cavalry of Julian the Philosopher exterminated with their arrows the last ostriches of the

Euphrates desert, that the lion disappeared from Continental Greece and Asia Minor at the very outset of historical times in these countries; and that *bos urus* of Western Europe was exterminated in the first centuries of our own era.

At the date of the iron industry, we first see the falcon employed for hunting (Fig. 82) in Transcaucasia, and this sport, so dear to the knights of the Middle Ages, has been pursued vigorously by the Orientals up to our own day.

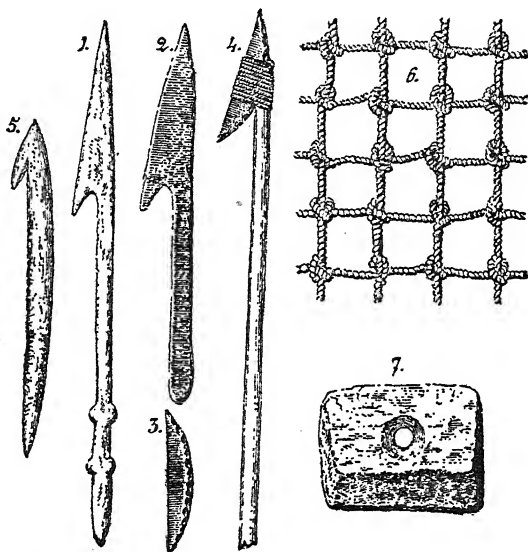


FIG. 83. Harpoons and fishing implements: 1, Ivory; 2, Copper (Abydos); 3, Flint (Helwan); 4, The hafting of No. 3; 5, Deer horn (Lake of Neuchâtel); 6, Robenhausen (Switzerland); 7, Pinewood float, Robenhausen (Switzerland). (Nos. 5, 6 and 7 after A. de Mortillet.)

Fishing.—If Man was a hunter of game, he certainly did not neglect the abundant fish in the lakes and rivers of those days—an abundance unknown now except in new countries where modern methods of fishing have not yet been applied.

There is no evidence available to inform us what methods of fishing were employed in the early days contemporaneous with palæolithic industry. The advent of the harpoon at the opening phase of archæolithic industry, however, provides certain proof that the predecessors of the Gauls hunted fish. No traces of fishing-lines, however, have been found,

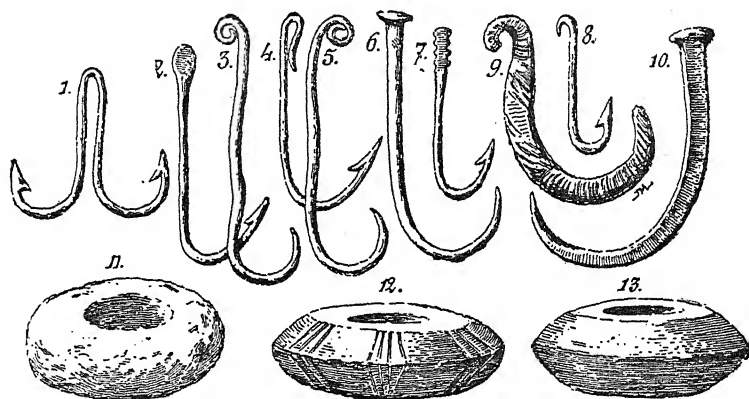


FIG. 84. Fish-hooks: Nos. 1 to 8, and 11 to 13, Swiss lake cities; No. 9, Susa; No. 10, Egypt.

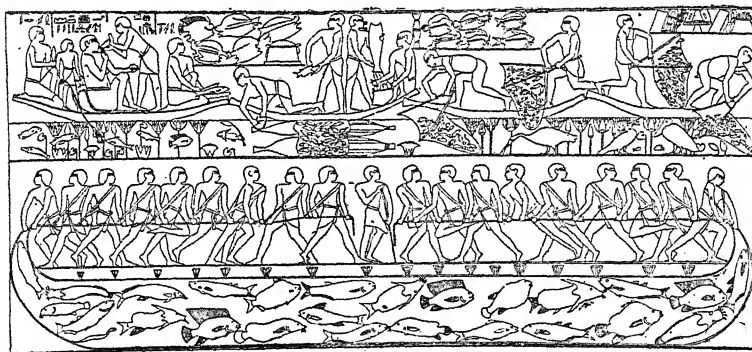


FIG. 85. Fishing scenes. Bas-reliefs from the tomb of Mera, at Sakkarah (Sixth Dynasty). Above: 1, Mera goes fishing in a boat; a servant gives him to drink; in the bow another servant splits the fish for drying. 2, Fishing boats picking up fish-traps. 3, Two boats with hoop-nets; fishing-birds are seen underneath. Below: Eighteen fishermen landing a seine full of fish under the orders of their leader.

but it may be remarked that fish-hooks could be made from splinters of bone or hard wood bound together to form an acute angle; the geometrical microliths (Tardenoisian or Tourassian) would seem to have been made for fishing.

The harpoon (Fig. 83, Nos. 1 to 5) in use towards the close of Quaternary times is present in all later industries down to our own day. It is made of bone, ivory, or metal, and certain small flint implements found at Helwan (Egypt), among other places, are probably harpoon points.

Fish-hooks (Fig. 84, Nos. 1 to 10) similar in form to those

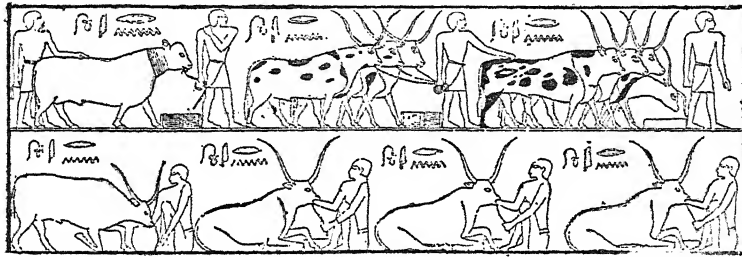


FIG. 86. Cattle of the Ancient Empire (oxen). Bas-relief from the tomb of Mera at Sakkarah (Sixth Dynasty).

in use to-day are found in large numbers in all the copper and bronze industries.

Nets (Fig. 83, No. 6) appear in the lake villages with neolithic industry; or, rather, it is in the lakes that the oldest specimens of net yet known have been found.

The netting seems to have been more often of the simple square pattern known as "thumbs" than of the more complicated "finger" pattern. Pieces of light wood (Fig. 83, No. 7) served as floats, while pierced pebbles (Fig. 84, No. 11) or the large holed discs of baked clay, called fusaroles or spindle-whirls (Fig. 84, Nos. 12 and 13), took the place of our sinkers for lines as well as nets.

In certain districts rich in lakes and streams, or situated by the sea, fishing was the principal means of livelihood; the Danish kitchen middens furnish proof of this, and the bas-reliefs left us by the Egyptians of the early dynasties show numerous representations of scenes of fishing with nets in the Nile or in the lateral marshes of the Nile valley (Fig. 85). The kitchen refuse of the Egyptians, moreover,

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contains a great deal of fish débris; and some of the vertebræ of these fish indicate that in those days veritable monsters of two or three metres in length were sometimes caught in the sacred river.

In Chaldea, a country of rivers and marine marshes, fishing was also held in great honour, and according to the archaic texts the legendary kings engaged in it. In Japan, China, Polynesia and even in certain parts of Europe, fishing still supplies the inhabitants with a large measure of their daily food.

Cattle-raising.—The domestication of certain kinds of

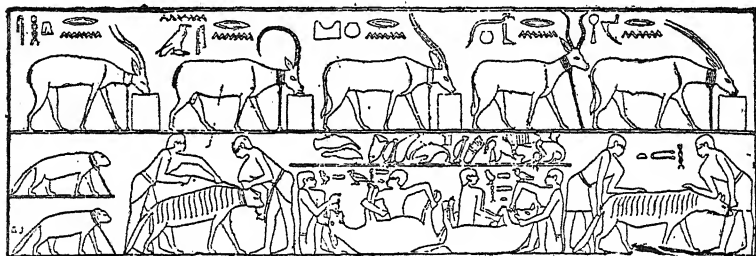


FIG. 87. Domesticated animals of the Ancient Empire: antelopes, gazelles, hyænas, and jackals. Bas-relief from the tomb of Mera at Sakkarah (Sixth Dynasty).

animals begins in our part of the world at a time when mesolithic industry was flourishing. The earliest domesticated animal seems to have been the dog, the hunter's companion and guardian of the hut, whose skeleton is found in the Danish kitchen middens. Hypotheses attributing the breaking in of horses to the Solutreans rest on no substantial base, nor can we seriously consider suppositions relating to domestication in Quaternary times.

Apparently it was at a much later date that Man made animals his auxiliaries and kept them for reserve food.

Pigs, horses, cows, goats, sheep and dogs had been tamed in the period of the pile-dwellings; wild Boar, Fallow-deer, Red-deer, a large Ox, Elk, Beaver, Cat, Fox, Wolf, Polecat, Marten, Badger and brown Bear, existed in the wild state. Man, ever a hunter, usually brought back to his dwelling only the most useful parts of the game, dismembering it where it had fallen. This custom, which we see practised

from Quaternary times, and which has been perpetuated by savage tribes to our own day, has enabled zoologists to distinguish between beasts slain in the chase and domesticated animals killed in the villages. Thus we find every part of the skeleton of the domesticated animals among the remains in the vicinity of the dwellings, but when we are dealing with game,¹ always the same bones.

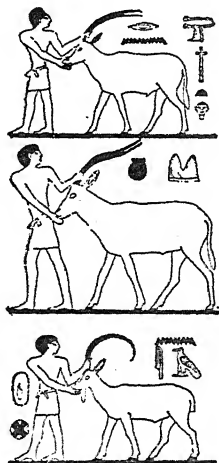


FIG. 88. Antelopes, from a Medum fresco (Third Dynasty).

We do not know where animal domestication originated. Certain authors² without any supporting proof pronounce for the Orient; but it would be more credible that such domestication had taken place in a number of different localities. The Peruvians, as Reinach observes, had domesticated the Llama, and the Aztecs the Turkey, before the Spanish conquest.³

While exploring the kitchen middens in Egypt, I found not only traces of the domestication of animals among the remains of habitations, but also the enclosures where the pre-pharaonic people kept their herds at night. These herds were composed, for the most part, of antelopes (*Bubalis buselaphus*), gazelles (*Gazella dorcas* and *isabella*), goats

¹ Cf. **XXVI**, I, 341.

² Cf. Zaborowski, *L'origine des animaux domestiques en Europe et les migrations aryennes*: XIII, Grenoble (1905), II, 1034.

³ **LXI**, 13.

(*Hircus thebaicus*), sheep (*Ovis longipes*), and bearded and ruffled moufflons (*Ammotragus tragelaphus*).¹ The ox was also known, for its remains are found in the kitchen débris, but we do not as yet know whether, at that period, it was wild or domesticated.

Among the herds which appear on the bas-reliefs of the Ancient Empire, we notice certain cattle (*Bos macroceros* and *Bos brachyceros*) as well as the Asiatic sheep. Their skeletons are constantly met with in the kitchen middens of Tùkh. Such live-stock was probably imported² at a very early period. We have nothing whatever to go by which might

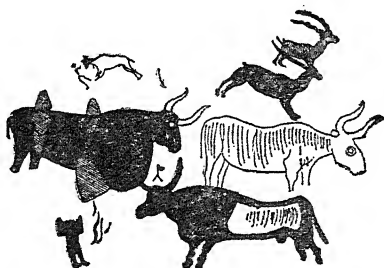


FIG. 89. Rock painting at Cogul (Spain), after H. Breuil.³

help us to determine the date of animal domestication in other lands; for instance, we are ignorant of the epoch in which the reindeer, so important an item of food at the close of the Quaternary period, first became the servant of man.

Agriculture.—To appreciate the conditions of prehistoric agriculture we must seek information from the period of neolithic industry in the Swiss lake villages, because the mud of the lakes has preserved for us in good condition the substance of plants, whereas in the other stations such traces have disappeared.

Dr Herr,⁴ whose work on this question deserves every confidence, has established the fact that the inhabitants of the lake villages harvested hazel-nuts, sloes, strawberries,

¹ LI.

² LXVII; Pièturement, *les chevaux dans les temps préhistoriques*, I (1906), 658.

³ The human representations are more recent than those of the animals. H. Breuil (*in litt.* Jan. 10, 1923). The relation between the two subjects is thus illusory.

⁴ Die Pflanzen der Pfahlbauten. *Neujahr. naturf. Gesellsch.*, 1896.

apples, water caltrops, beech-nuts, acorns and grapes as food either for themselves or for their herds; and Neuweiler¹ recently drew up a list of nearly 120 different sorts of prehistoric fruits, without including cereals such as rye, barley, wheat, and oats, which abound in the pile-dwellings either in grain or ear. Sir John Lubbock² tells us that the inhabitants of lake villages cultivated three kinds of wheat, two of barley, and two of millet.

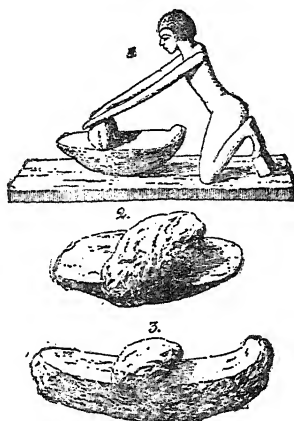


FIG. 90. 1, Wooden statuette (Third Dynasty), Dahshūr; 2, Monsheim (Rheinhausen); 3, Susa.

It is impossible to tell whether all these sorts were indigenous, or whether they had been imported from other countries such as Mesopotamia, where graminaceous plants are common: we can only state with certainty that the Egyptian wheat (*Triticum turgidum*), and the six-rowed barley (*Hordeum hexasticon*), a variety which the people of antiquity cultivated in Greece, Italy, Egypt and Western Asia have been found in the Swiss lake dwellings. In every land—Egypt, Chaldea, Italy, and Hellenic countries—from the earliest times of the polished axe, we find hand milling-stones (Fig. 90), common also to mesolithic and neolithic stations, and lake cities. These hand mills consist simply of a large, flat nether stone of hard rock and an elongated grinding stone flattened on one surface. With this primitive

¹ LXXII.

² IX, 4th edit., I, 204.

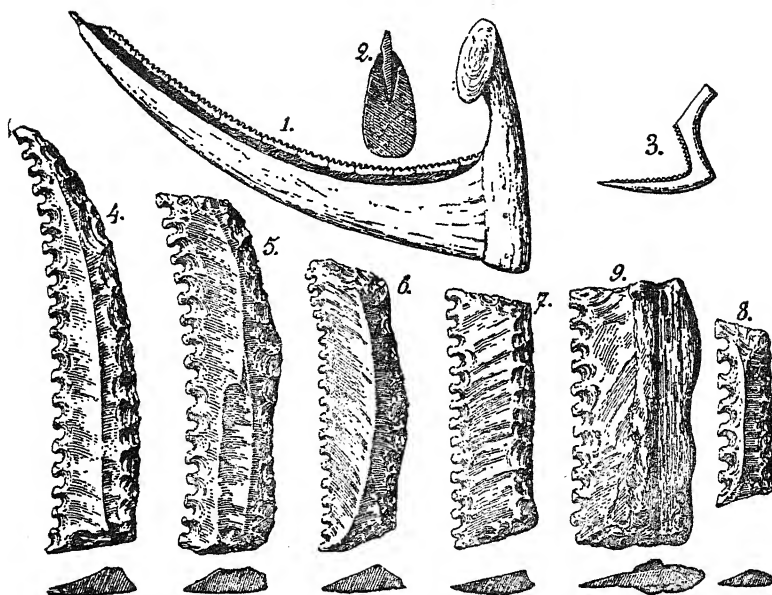


FIG. 91. 1, Wooden sickle armed with flint, after W. M. Flinders Petrie, *Illahun Cahun and Gurob*, pl. III, Fig. 27; 2, Section showing the method of mounting the flint, and the bitumen cement; 3, Hieroglyphic from a Medum fresco (Third Dynasty). The handle is painted green and the teeth white; 4 to 8, Sickle pieces; 9, Flint still showing the bitumen cement and the marks left by the wooden handle.

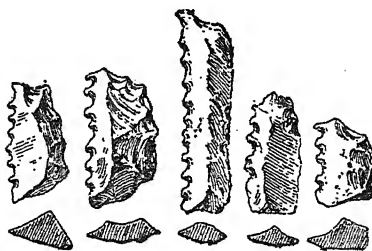


FIG. 92. Abuchal, near Carmona (Spain), after G. Bonsor.

implement, still found to-day among some backward peoples, the lake-city populations ground the coarse flour with which they made their loaves. A good many specimens of these have been found at the bottom of the lakes, a sort of flat, unleavened "bap", analogous to those made by many African and Asiatic peoples to-day.

The most curious discovery of recent years relating to

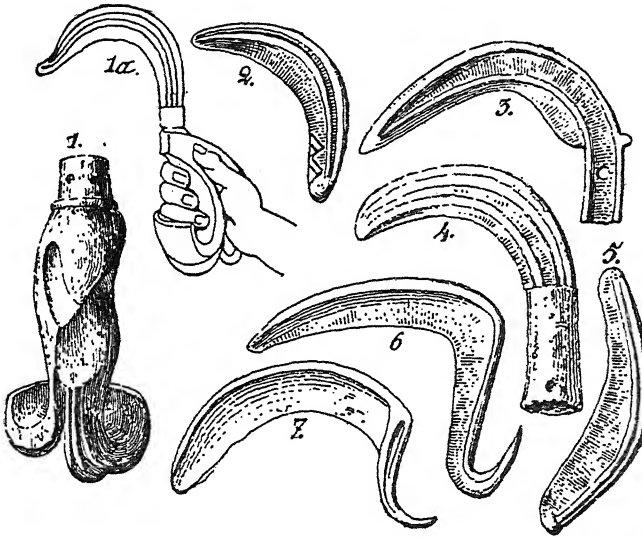


FIG. 93. Bronze sickles: 1, Moringen, Lake City (Switzerland); 2, Corcelette; 3, Guévaux; 4, Athlone (Westmeath); 5, Jura; 6, Hungary; 7, Caucasus.

prehistoric agriculture is that made by Flinders Petrie in Egypt. He found a wooden sickle armed all along its cutting edge with serrated flint blades (Fig. 91). Up till then these flint implements, extremely common in all neolithic and eneolithic stations in Egypt, had been thought to be saws. This it is evident they are not, and it is possible to recognize on almost each blade of this kind, now scattered abroad, a peculiar polish on the teeth that has been caused, not by friction against a hard body but by some pliant substance, such as straw, rubbing away the projecting ridges. In Chaldea (at Yokha), in Elam (at Susa), and at the lowest level of all the *tells*, we find these

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sickle pieces in great quantities; almost all of them are worn like the Egyptian ones, and are covered with a patina produced by weathering since their abandonment. They are also found in Syria and Spain (Fig. 92).

The existence of this wooden implement armed with flints shows how important it is to be prudent in our assumptions regarding the use of chipped flints whose method of mounting is unknown.

With the coming of metals we see the form of the sickle changing; it differs slightly in different countries, but it



FIG. 94. Cultivator and his plough. Rock carving from Bohusland (Sweden), after A. Montelius.

is always a curved blade, furnished with a stouter back (Fig 93).

The date at which the plough made its appearance (Fig. 94) is impossible to fix, because at first this implement had no ploughshare and consisted only of a hooked piece of wood, one of whose branches was attached to the yoke, while the other penetrated into the soil; it was later only that the plough was armed with metal. A considerable number of iron ploughshares are known. In Egypt, however, we find very large chipped flints which are supposed to have been used as ploughshares.

Chariots are found in Chaldea, Egypt, Italy, Greece, and in almost all Mediterranean countries during the bronze industry. In the north and west of Europe they are quite common from the time of the Hallstatt culture (Fig. 95), though they had existed much earlier, as the Scandinavian votive chariots prove.

All this progress came about gradually, either as the result of native inventions or through contact with more advanced peoples. Thus Man, clinging to the soil he had cultivated, modified his manner of life and from being a

hunter became sedentary. In many mountainous districts, however, the needs of his herds obliged him to conserve somewhat of his old nomadic existence, and to seek

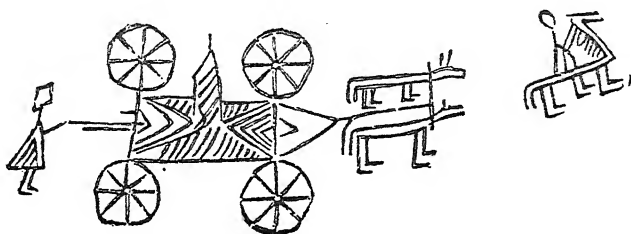


FIG. 95. Vehicle, with horses harnessed to it, incised on a clay vase (Iron industry) Ódenburg (Hungary).

pasture according to the season. It is thus that most of the Kurdish and Tartar tribes of Asia live to-day. For the most part their villages are built in the midst of the cultivated lands and the winter pastures; but when the heat comes, they go up into the mountains, returning to the village for a short time in the summer for the harvest. Then they go back to the mountains till the snow drives their cattle from the upper pastures.

CHAPTER III

DRESS AND ORNAMENT

ACCORDING to the rare representations of Man dating from the Quaternary period, it would seem that in Western Europe in those days he went naked, or did not need clothing; for even if in the cold season he covered himself with the skins of animals killed in the chase (which is not indicated, however, in representations of him) this did not prevent him from exposing himself to wind and weather. Perhaps Nature, with forethought in this regard as in the case of the pachyderms, had provided him with a fleece—certain gravings on reindeer horn at least suggest it. If this was so in cold climes, *a fortiori* it could not be otherwise in hot. Thus, in Egypt, even in the days of neolithic industry, Man does not seem to have been clothed. The most ancient drawings show him naked or protected simply by a sort of loin-cloth, which is the case to-day with most savage communities in hot countries, and even with some in lands such as Patagonia where the cold is intense.

In the caverns, at the floor level of archæolithic industry, a number of bone and ivory needles are met with, from which we may draw the inference that the people of those days sewed furs to cover their bodies in winter, as the Kamchadales do to-day. It would not be safe, however, to attribute to them any knowledge of textile fabrics.

However this may be, it is during the course of neolithic and eneolithic industry that we first definitely find cloth. The proto-Susians made a linen cloth of quite fine texture. It is even probable that under the early dynasties of the valley of the Nile the people wore those cotton stuffs of which we find samples, so well-preserved, on the mummies from the third dynasty onwards. Since the burial-places of the first princes of Upper Egypt were given to the flames, all

the perishable materials they contained have disappeared ; and in the graves of the common people not a trace has been found of any textile fabric, which, moreover, had it already existed, would have been a luxury.

In Western Europe the lake-city people spun and wove flax, but did not yet know of hemp ; but this was not the flax

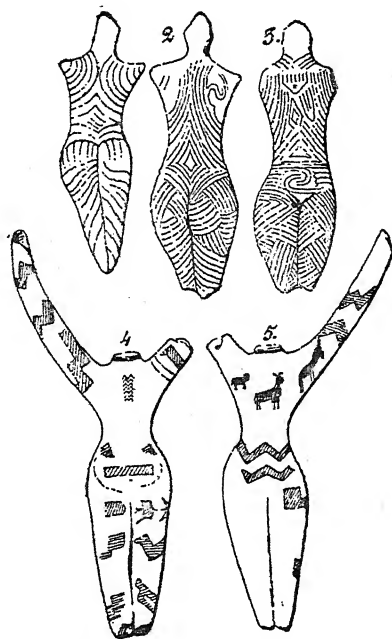


FIG. 96. 1 to 3, Clay figurines with engraved designs (Jassy, Roumania); 4 and 5, Clay figurines with painted designs (Tûkh, Upper Egypt).

we cultivate to-day, but a narrow-leaved species (*Linum angustifolium*) which still grows wild in Mediterranean countries, and which in early days they probably gathered wild.

The custom of going naked, however, would seem to have persisted for a long time after, for the practice of tattooing and painting the body was continued up to historic times in Europe and Africa, and assuredly in Asia also. It will suffice to cite the figurines discovered in Roumania (Fig. 96, 1 to 3) and those of Upper Egypt (Fig. 96, 4

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and 5) representing dancers; they all belong to neolithic, or at the latest to eneolithic industry.

Corporeal decoration is effected in two ways: by indelible tattooing (done with a needle which injects the colour under the skin), and by superficial painting. These two processes are still in use among all primitive peoples; but it is impossible to distinguish them apart in the drawings left to us



FIG. 97. 1 and 2, Mycenæ; 3, Knossos.

by prehistoric Man. In Egypt and Chaldea these customs seem to have almost gone out at a very early date. Similarly in the Ægean world, as in Crete, if tattooing and corporeal painting existed at all, it would appear to have been exceptional. Painting the person, in all ages and in every land, was incidental, and practised, as a rule, in connection with religious rites, or on certain days only.

The characteristic costume of different peoples has been extremely varied from the time when clothing first came into use, up to the beginning of the nineteenth century—to which belongs the melancholy honour—from an artistic point of view—of having begun its unification. Dress in prehistoric times, however, is almost a sealed book to us, because we

can judge of it only by the rare representations that have come down to us, and by archaic figurines, whose costumes bear witness only to the fashions in dress of one or two districts (Fig. 97). For other regions we are reduced to

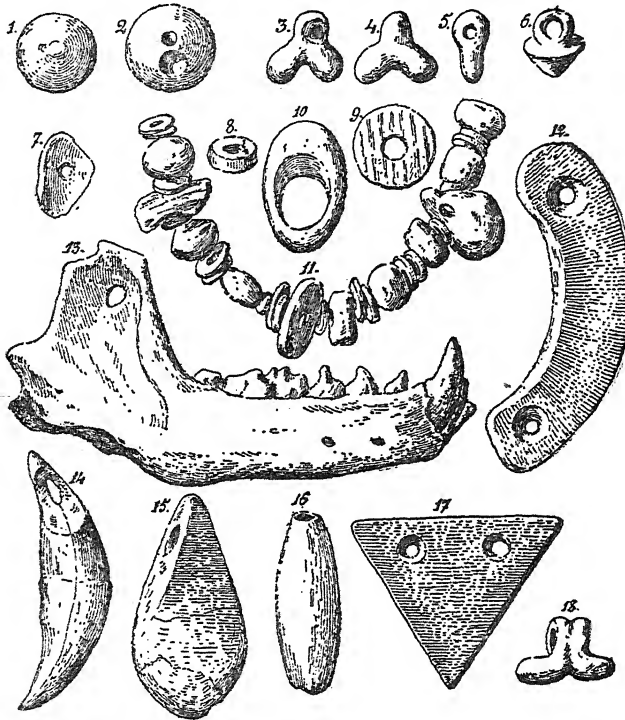


FIG. 98. Stone industry amulets and necklace. 1 to 6, Grotte des morts (Gard). 7, Aveyron. 8, Steatite: dolmen of Aiguèze (Gard). 9, Scallop shell: dolmen of Gamat (Lot). 10, Shell (Dijon, Côte-d'Or). 11, Shell, bone and schist: dolmen of Vinnac (Aveyron). 12, Luzarches (Seine-et-Oise). 13, Camp de Chassey (Saône-et-Loire). 14, Dog's canine (Lake Constance). 15, Callais: dolmen of Carnac (Morbihan). 16, Steatite: dolmen of Vayssières (Aveyron). 17, Lignite: dolmen of Bessoles (Aveyron). 18, Alabaster: dolmen of Montaubert (Aveyron).

conjecture based on the objects found in tombs, which, however, throw more light on the jewelry worn by the men and women of those days than on their costume.

Assuredly men and women decked themselves with ornaments from the time of the Quaternary industries; but even their most primitive ornaments are still almost unknown to us.

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It is among the remains of neolithic industry, in the burial-places and lake villages, that we first find any number of amulets and beads from necklaces (Fig. 98). In neolithic and eneolithic graves in Egypt, necklaces of beads or shells, pendants and bracelets of ivory, alabaster, mother-of-pearl, and even of flint, marvellously chipped (Fig. 99, 5), are constantly met with ; but real jewelry only begins with the bronze industry.

The most interesting ornament from the point of view

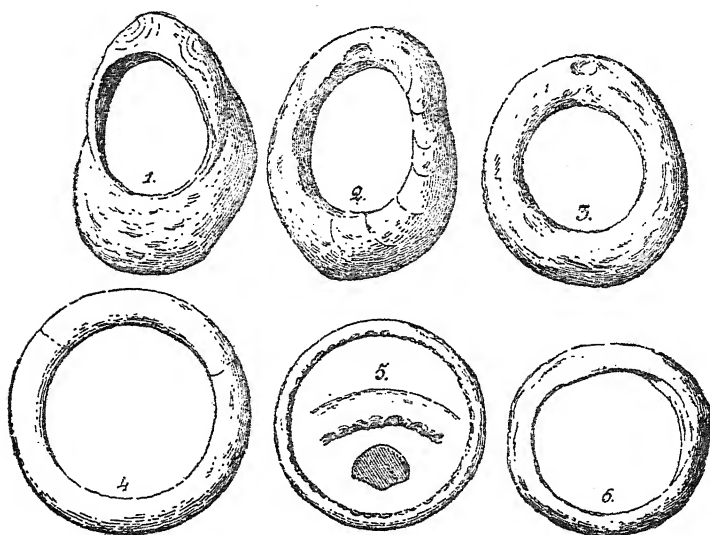


FIG. 99. Bracelets, 1 to 3, Frignicourt (Marne). 4, Alabaster (El Amrah). 5, Yellow flint (Abydos). 6, Mother-of-pearl (El Amrah).

of its variety is the fibula, which appears with the bronze industry and is still used to-day. Before the fibula was known, however, and in countries such as Egypt, where it was never in use, there were other means of fastening together two pieces of cloth. In Russian Armenia, in the sepultures of the first iron industry, all the graves contain a large pin ; and in one of these graves, by a lucky chance, the pin was still fastened in the remains of the cloth, and bound around with the string which held it.¹ Thus a pin satisfactorily took the place of a fibula, and we may

¹ Cf. J. de Morgan, **XXXVII**, I. Musée de Saint-Germain.

therefore assume that pins found with products of archæolithic industry were used in a similar manner, either to hold skins together, or to fasten the folds of woven garments. Later still came the button, a small piece of metal with a ring attached.

In Egypt, as in Elam, the fibula does not seem to have been generally used even in historic times. It is never found in the pre-pharaonic or proto-Elamite tombs; and there are none in the deposits at the foundations of the temple of Shushinak. It is found, however, at Muquyyar and at Warka in Chaldea, in sepultures which are supposed to be very ancient, though their date is uncertain.

The primitive type of fibula is the safety-pin (French "*archet*" = "bow"), in which the metal stem does all the work; folded back on itself, it forms pin, catch, spring, and back—which soon becomes highly ornamental. Thenceforward the fibula is made up of several parts adjusted to a central motif that is often very complicated.

In the Eastern Mediterranean world the fibula would seem to have made its appearance at the same time as the *peplos*, of which it was the indispensable complement; for this feminine garment, as it was not sewn, had to be held on each shoulder by a brooch. This ornament appears only towards the end of the Mycenæan period, and was but little in use up to the time of the Dorian invasion, when it became general. One may assume, therefore, that the *peplos* and the fibula came into Greece from the North; but originally the fibula was not peculiar to the *peplos*. From very ancient times it was in use among the people of North Asia and Western and Central Europe. It appeared, for the most part, contemporaneously with the late bronze industries in both Italy and Gaul. In Transcaucasia and the north-west of Iran, it came in with iron. Its absence in Egypt and Susa supports the opinion that this ornament is of central Asiatic origin.

Other prehistoric ornaments have but the single purpose of adornment—necklaces, diadems, bracelets, anklets, rings, ear-rings, pendants and metal pieces sewn or attached by hooks to the clothing, and finally belts, which in certain countries served also as defensive armour.

The most ancient necklaces are made of small objects

strung together. These are usually mineral beads of turquoise, calläis, chalcedony, agate, cornelian, hæmatite, amber, etc., marine or river shells, hard berries, beads of ivory or bone, or in metal such as gold, silver, copper or iron, varying with the locality and period, and finally glass beads which appear in Western Europe at the time of the bronze industry. Generally an amulet or conspicuous pendant like the Egyptian breast-plate, was suspended from the centre of these necklaces, and hung on the breast.

During the metal phases there were more of these and they alternated with beads all round the necklace; they are occasionally made of stones, but usually of gold, silver, copper, lead, tin, antimony, etc.

Then comes the rigid metal collar, of which the most perfect and at the same time the most ancient type is the torque, frequent in all epochs and in most localities except Chaldea, Elam and Egypt. Later it becomes elaborated by having a hinge in the centre.

The bracelet, common to all districts and probably of very ancient origin, presents highly diverse forms. Sometimes, like the necklace, it is composed of beads; sometimes it is in one piece and rigid, made of mother-of-pearl, limestone, or even flint (Egypt), jet, ivory, horn, pottery, metal or glass. It was worn, in different countries, on the wrist, the ankle, or the forearm.

The ring appears only with the metals. In early times, and for long afterwards in certain countries such as Elam, it was nothing but a more or less ornamented circlet. Elsewhere, in the Ægean world, for example, the gem and its setting become prominent and covered with designs. Then it became a seal, and replaced both the Chaldeo-Assyrian cylinder and the Egyptian scarab, which, during pharaonic times, was not mounted in a ring. In Western Europe the ring does not seem to have become prominent as an ornament before the spread of Mediterranean taste.

The ear-ring is at least as old as the metal industry. At first it was simply a metal stem, tapering at its extremities, later it was bent into a circle; but soon this ring supported pendants which were often large, especially in the Hellenic world.

In the examination of burial-places we sometimes find a

single loop of this sort, and one is tempted to think that these single rings were worn in one of the ears only, as is the custom amongst certain of our maritime populations to-day. It must not be forgotten, however, that among many Asiatic peoples, in India for example, the women wear a single ring in one nostril. It is possible that this was a practice in Western Europe and many other localities in prehistoric times.

The diadem also played a great part in the ornament of Mediterranean peoples, and it may have been a symbol of authority in very early times. In Egypt it was of capital importance, and thence the custom may have passed on to the Hellenic countries, and subsequently into Italy and Spain. The adoption of the crown as the emblem of sovereignty grew out of this practice.

The belt, which at first was a simple band of leather or cloth, soon became ornamented in metal, and then became entirely covered with gold, silver, or bronze leaf. Thus it developed into a protection for the vital parts, hence the idea of forging a cuirass to cover these organs. Metal belts are numerous in certain of the burial-places of Transcaucasia, but we find them also, though less frequently, in the Mediterranean world. They came, no doubt, into our part of Europe from the northern Orient, for they are found neither in the valley of the Nile nor in the land of the Tigris and Euphrates.

Sequins on clothing vary greatly in all countries, but the Asiatic love of display made the most of them. We find little evidence of them in Europe except among the Mycenæans. In general they consist of small leaves of cut metal, plated over and pierced with holes to permit of their being sewn on to cloth. The zenith of this fashion of dress decoration was in Byzantium at the time of the Basilii.

Every people brought to the manufacture of its ornaments not only care but all its artistic genius. The craftsmen sought therein to achieve the ideal of contemporary taste, and thus we see in jewelry an infinite variety of form and ornamental motif. The general form was obtained by casting or beating metal. The artist then took it over and finished it either with a burin or by the addition of filigree work, and later encrusted it with gems.

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We have seen that graving was already known and even practised with considerable skill in our own lands from the time of the Magdalenians ; but the processes of the caverns did not give birth to the arts of the sculptor and graver of modern civilization. All the peoples of Asia practised them when the Occident was still in the barbaric stage of artistic taste demonstrated by neolithic populations. In Egypt, however, as in Chaldea, these arts do not seem to have been applied to metal from the inception of the bronze industry. It would even seem that for many centuries after, copper did not attract the attention of artists, for neither in Elam, nor in the Valley of the Nile do we see metal implements ornamented with fine graving. It seems probable that a taste for this work was brought in by races who, in very ancient times, settled to the east of the Mediterranean, leaving behind them on the Continent their congeners who were inspired by the same artistic tastes, or, at least, who were familiar with the same processes.

Filigree comes much later, demanding a more advanced technique necessitating a knowledge of soldering. It was known in Egypt from a very remote epoch, and in the twelfth dynasty it reached rare perfection. In Susa it figures in very ancient foundation-deposits, so that we can assert, without fear of exaggeration, that in Chaldea, as well as in the valley of the Nile, this type of work was quite common in the thirtieth century before our era. These countries transmitted it to the Ægeans, who, in turn, introduced it into Western and Central Europe through Greece. Certain peoples, however, coming from Central Asia by way of the steppes of Russia, seem to have received it when at a fairly recent date they came into contact with Iran, together with the arts of setting precious stones and of enamelling jewelry, the latter being a process which is only a simplification of the incrustation in metal of coloured or sparkling minerals. But this elaborate jewelry only came among the Northern peoples long after the Occident had learned filigree work from the Greeks and Etruscans.

PART THREE

INTELLECTUAL DEVELOPMENT AND
INTERCOMMUNICATION

PART THREE

INTELLECTUAL DEVELOPMENT AND
INTERCOMMUNICATION

CHAPTER I

THE ARTS OF PREHISTORIC PEOPLES

IN the study of artistic production two distinct elements of entirely different order must be envisaged—technical process and artistic conception—though both render mutual aid and influence one another. Technique depends on a people's industrial knowledge, whereas artistic taste is inborn and peculiar to each human group, being part of its heritage. Artists in expressing themselves take advantage of the practical processes evolved from the industrial development of their national group.

Both in technique and artistic conception the native tendencies of a given group are frequently influenced by foreign ideas and methods, but none the less does the genius of the race remain individual in the sum of its productions. It was thus with the Greeks who, though they had borrowed many of their ideas from Egypt, followed their ancestral tendencies, broke away from the rules of Asiatic and Pharaonic art, and, returning to Nature for their inspiration, attained to the summit of art; whereas other less gifted peoples sprung from the same stock, remained their inferiors from the artistic point of view, though they had undergone the same foreign technical influences.

Before we begin to study the art forms of different nations, something should be said of the processes involved in the artistic expression of thought, because we have to bear in mind that the production of a work of art has ever been limited by the available means of execution. In the course of centuries the technique of this expression has advanced

among different nations along with the development of general culture. It was dependent at first on very simple means, which have continued to be elaborated up to our own day, when according to their development they have permitted artists to realize their ideal more or less adequately.

Drawing, graving, painting, and sculpture are the principal branches of art. The first three are intimately connected with one another, and the third, though also evolved from drawing, is yet independent. Indeed, there are not wanting sculptors, who, although mediocre draftsmen, execute impeccable works in relief.

The impulse to draw, whether in the decorative or naturalistic manner, is innate in every people and is to be met with in every age and in all parts of the world; and although the execution varies in success, the procedure is always the same. The artist makes an outline with colours that are either darker or lighter than the surface on which he is working. Charcoal, ochre, and chalk were in use from very ancient times. These colours were applied either dry or wet, and, when put on wet, constitute Man's earliest essay in painting.

It would seem that from the remotest epochs, in the caverns, on the Nile banks, and in the Eastern Mediterranean, a drawing was done in two stages, just as it is to-day—first, a sketched-in outline roughly giving the form, then a definitive drawing, worked-up from the sketch, in a different colour.

Graving followed as a means of fixing the finished drawing; this was done by inscribing the line with a stone or metal graving-tool. Sculpture in bas-relief developed from graving, the intention being merely to give an impression of relief, and though it is often scarcely more than a suggestion of form, it was enough to please the eye and give satisfaction to the spirit of the artist.

Painting is another means of achieving relief, but in the primitive arts it did not play this part, being limited to rendering the colour of the object in the flat. It was later only that the artist thought of depicting shadows, and thus giving to his creation an apparent relief. In Greece and in Egypt, colour used to be applied to bas-reliefs and statues. The representations covering the walls of the mastabas of Pharaonic

times, and the statues themselves, were painted in conventional colours, approaching as nearly as possible to nature. The material of these sculptures was of importance only in the degree of its hardness, which might thus ensure for the image a longer preservation. The graving of cave drawings seems to have been done in the same spirit in an effort to resist deterioration. Among the Hellenes, as in Egypt, bas-reliefs, statues, and architectural motifs were coloured.

With the arrival of metal, the processes of figuration developed. From that time the graving instrument or burin became the artist's principal tool; jewels, bronze weapons and belts, and divers utensils were engraved with this instrument, while the art of statuary, which had been very crude in the time of the stone industries, began in certain lands to feel its wings during this period. The general form of metal implements and figurines was obtained easily enough by casting, then the object was finished with a chisel and inscribed if it was to be thus ornamented.

We can easily imagine how arduous was the work in hard materials when Man still had nothing at his disposal but stone tools. The troglodytes sawed up pieces of ivory, bone and horn, and it was thus that the general form of the subject was rough-hewn. The work was finished by means of scrapers, graving-tools and polishers. But when the metal chisel appeared, not only was the work itself more rapid, but the sculptor had every facility for making his tool amenable to his will.

To those hard materials on which the earlier artists exercised their talents, there were added later others whose plasticity permitted modelling. The invention of pottery gave to the artist a new and effective means of self-expression.

From the day that Man first knew fire, he must have hovered on the discovery of ceramic industry. The clay of his hearth hardened by the fire taught him that earth once baked is no longer friable under the action of water. Nevertheless, as we have seen, it was only at the time when mesolithic culture came in that pottery was actually in current use, although it was already known to the Magdalenians of Belgium.

These first essays in the ceramic art are extremely crude, if we may judge by fragments found in the caves near Liège, but the principle had been discovered and applied. With the Campignian culture we are in the presence of a more carefully thought-out manufacture. The numerous potsherds found among the hut foundations of the Bresle Valley are occasionally of carefully-chosen fine earths, but usually the *pâte* is coarse. Geometric designs are frequently incised on both. The potter's wheel was still unknown at this epoch, and does not appear until later, in the polished stone phase, and even then only in certain countries.

In the study of pottery, three elements must be sharply distinguished as independent one of the other, though together they constitute ceramic art, whether advanced or crude. As all three are susceptible of numerous variations, the general study of pottery becomes extremely complicated.

First of all the technique of the manufacture of the vase, the plastic material of which it is made, the preparation of the *pâte*, and the degree of baking must be taken into consideration, since pottery can be hardened beside the fire, baked in an oven, or vitrified at a high temperature.

Then comes the decoration which is both a technique and an art in itself. The technique comprises the processes of inscribing, glazing and enamelling, and these methods, of great variety, follow in a general manner the progress made in the different industries of a given district. The actual form of decoration depends on the tastes of the people, being modelled on their art, and simply translates into a special medium the æsthetic conceptions of the locality and the time.

In all the different countries the technical processes of vase decoration follow a general order in their appearance throughout the entire prehistoric period. First, incision, with or without filling the depressions with white or coloured *pâte*; next the glossing of the earthen paste of the vase itself, or the addition of a clay glaze; then the imprint by mechanical means of a design, followed by moulding and the addition of ornament in relief, and finally cold painting with colours mixed with fat or glue, fast painting, done on the unbaked or baked paste, and then burned in by fire, culminating in enamelling. Over and above these processes, all of which

were in use at different dates and in different countries during prehistoric times, there are to-day a great many other methods—thanks to recent discoveries—which there is no occasion to mention from the prehistoric point of view. It should be noted, however, that porcelain made from a hard paste was unknown, that certain colours such as blue, green, and violet were not used, and that the ancient *pâte*, except in rare cases, was always a natural one—that is to say, colouring matter was not mixed with it. Colour, then, was generally superficial, and obtained with iron and manganese only. The Egyptians discovered porcelain very early, but they employed a soft paste, covered with a glaze which vitrified at a low temperature. This was the process employed in the ancient potteries of China. In Elam and Chaldea the employment of a vitrified glaze is seen from the time of Naram-Sin, and was continued up to the Sassanid and Arabian epochs.

Sometimes, but very rarely, the potters encrusted their vases with sparkling or transparent minerals either before or after firing. Certain vases of the iron industry of Russian Armenia have at the bottom a flake of obsidian fixed in the soft clay and fired with the paste.

In the earliest days the potter had only a utilitarian object, and the vase's shape was determined by its use. Therefore but few varieties are met with in the shapes of primitive vases, and these were evolved spontaneously in every land. But little by little, as local taste became refined independently of other districts, local characteristics both in form and in decorative subjects appeared among each people. Then certain centres more favourable to progress, where culture was more highly developed than in the neighbouring districts, influenced the taste of these backward populations, so that to local progress was added external influence, and thus so many ceramic schools sprang up that it would be quite impossible to review them all, even summarily, without overstepping the limits of this book. We shall mention only those most worthy of interest, either on account of their antiquity or because of their intrinsic importance.

Pottery really appears contemporaneously with mesolithic industry, and from its earliest essays it exhibits incised decoration on the lines of the bone decorations of archæolithic culture. Such work proved easy in the soft paste, as

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the graving-tool cut deeply into the clay, and to give more prominence to the design the incisions were often filled in with a white or coloured paste.

Handling the soft potter's earth naturally put into the artist's head the notion of fashioning figurines. Thus was born the art of modelling, which became of still greater importance on the appearance of metal. At first modelling was done in wax, then statuettes were done in *cire perdue*. Moulds were made, in which it was only necessary to press soft clay in order to turn out figurines in great numbers. It was thus that votive offerings, pendants, and sacred and funerary statuettes were made in Chaldea, Elam, and Egypt.

In some countries, however, as in the valley of the Nile, Susiana, Syria, and the Eastern Mediterranean, the pottery was not only decorated by the incised designs but was also painted before or after the paste was baked. Thus arose the highly specialized art that among the Greeks and Italiotes reached such technical and artistic perfection. Gradually these processes spread to Central and Western Europe, but here, for a long time to come, the crude painting of pottery was secondary to the incised decoration.

Far from Europe ceramic painting also evolved in the Americas. Mexico and Peru excelled in this art.

In the early days of every metal culture, the metal was simply cast and hammered, beaten into repoussé, embossed or engraved, and the various parts were bolted or riveted together, for soldering did not appear until very much later. The method was used for bronze and gold at a date that has not been determined. Then, in jewelry, filigree appeared, of which the jewels of twelfth dynasty Egypt and Elam are remarkable and antique examples. The Greeks and Etruscans produced incomparable works of art by these processes, at a time long posterior to their appearance among Orientals. Filigree then penetrated the north of Europe, and constituted the foundation-technique of the jewelry of Scandinavia and the Germanic tribes.

This brief glimpse of technique renders it possible to follow the evolution of art-crafts as the media of man's artistic self-expression. We must note the facts at this point that certain peoples who had but the most primitive technical processes at their disposal nevertheless left highly remark-

able works of art denoting wonderful purity of taste and close observation of nature, whereas others who had every advantage in technical means never rose above mediocrity in their æsthetic inspiration. Thus, even though technique counted for much, its influence on the development of the arts was not decisive. It was the individual aptitude of a given human group that created this or that promising artistic school.

This said, we may pass in review the varying manifestations of the æsthetic spirit, ranging them in the epochs giving them birth, and with due regard to their milieux, pointing out their several characteristics, and—so far as is possible—estimating the foreign influences at work in each school. In such a study ceramics take their place as æsthetic manifestations for they are inspired in the same way as the other arts, differing from them only in the nature of the material decorated and in the technical processes of design, and so, contrary to the usual custom in works of this nature, we shall not treat ceramics in a chapter apart, but grouped together with other artistic products. Nevertheless, we shall often be obliged to refer to technique, because of its influence on the artist's work.

The earliest works of art so far discovered are found amongst the débris of archæolithic industry. No trace of artistic effort has yet been met in association with the different phases of palæolithic industry, and yet, when we do meet the evidence of æsthetic feeling, it would seem as though it must have been cultivated for a long time, for it is no longer in its infancy.

It is true that, so far as Aurignacian culture is concerned, the relics of the work of Quaternary artists we possess are few and far between. But until we are better informed we must consider this culture as having seen the dawn of art. Thanks, however, to the magnificent discoveries of the past few years, we are comparatively rich in regard to later Quaternary times.

Are we to believe that Magdalenian art evolved from that of the Aurignacians? Many reasons lead us to reject this hypothesis. The two schools differ notably in character and tendencies, and Solutrean culture has left us too few evidences to enable us to establish the transition. The

various tribes responsible for the two different schools were probably of different ethnic origin, hence their aptitudes were also different. It is probable, however, that the Aurignacian efforts were not without their influence on the cave populations succeeding them, at all events in so far as technical processes were concerned. Art, in fact, is the characteristic mark of the times in which archæolithic industry flourished. Its manifestations, in so far as we know them, show that it had already attained a high degree of perfection; of its masterpieces we are ignorant. It has been held by some that the artistic taste of the period was born in Western Europe under the influence of foreign civilization. Sophus Müller¹ has gone so far as to suggest that we should recognize in our Quaternary western art a gleam projected by the radiance of Egyptian pre-pharaonic civilization. Nothing could render such a hypothesis legitimate, for a supposition of this kind implies a chronological agreement for which we have no authority.

It would seem quite unnecessary to torture chronology in order to link up our European civilizations with such distant centres, for there is no reason whatever why æsthetic feeling should not have come to birth in our part of the world and there have developed in districts which have not yet yielded up their secrets, nor that these artist populations, wandering from locality to locality, should not eventually have come to dwell in our caves. Thus through their influence their arts would have spread from the territory they occupied, or, when they themselves changed their habitat, they would have left traces scattered over regions far greater in extent than those they occupied at any one time. It would be somewhat rash at this time of day and in our present inadequate state of knowledge to dogmatize on the place of origin of this culture, just as it would be premature to attempt to classify definitively these Quaternary works of art, whether according to the nature of their execution, their relative age or geographic distribution. Each day brings new discoveries, which sometimes upset all the theories previously held. In regard to such questions we are still at a stage in which science must content itself with placing the evidence on record.

¹ LXXI, 8.

Piette, as we have seen,¹ proposed the establishment of a glyptic period, because in his excavations at Bassempouy, at the Aurignacian level, he found a good many ivory statuettes, mostly representing women in the nude, but these observations were purely local, and we ought not to deduce

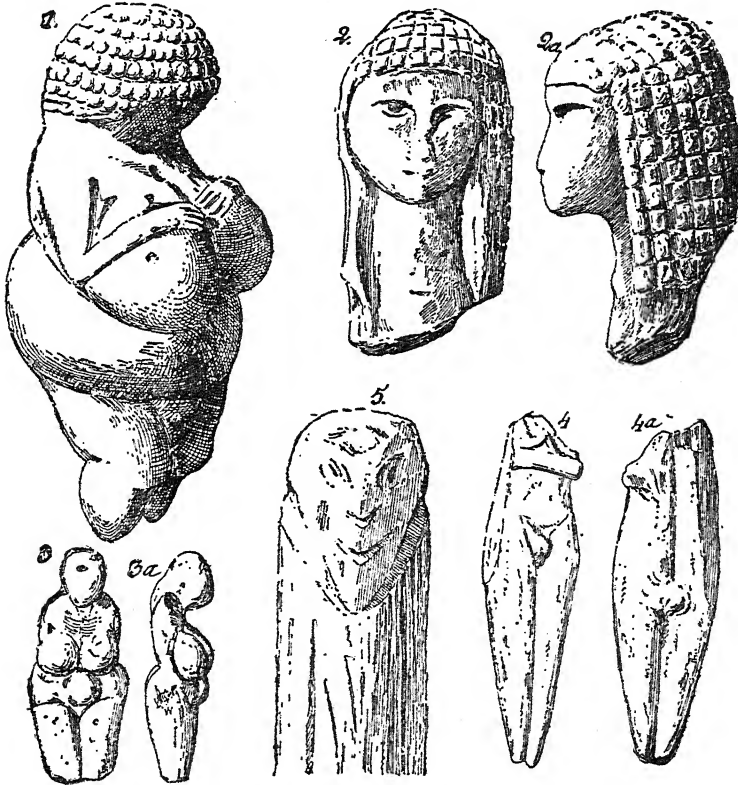


FIG. 100. Quaternary statuettes. 1, Willendorf (Austria): Aurignacian or Solutrean; Vienna Museum. 2 and 2a, Bassempouy (Landes). 3-5, Aurignaco-Solutrean. 3 and 3a, Grotte de Grimaldi at Mentone. 4 and 4a, Man (?), Bassempouy (Landes). 5, Rochebertier (Charente).

from the almost complete absence of other artistic works that sculpture in ivory only was customary at the epoch characterized by Aurignacian industry. Graving was not entirely absent from Aurignacian and Solutrean levels.

Quaternary art, says Déchelette,² consists of two distinct

¹ See above, p. 54.

² **XXVI**, I, 213.

phases: an archaic or primitive style, and a free or evolute style. Realistic and naturalistic from its inception, it retains the same character throughout its development, although degeneration of the typical motifs gradually introduces conventionalized forms into its creations, and the schematism of these forms is occasionally obscure.



FIG. 101. Graven human representations. 1 and 2, Laugerie Basse (Dordogne): graven on reindeer horn. 3, Mas d'Azil (Ariège). 4, La Madeleine. 5 and 6, Marsoulas (Haute-Garonne): on rock.

It seems to me to be impossible to follow Déchelette in this classification, for the artistic character of the Aurignacian figurines appears to be the result, not of archaism, but of ideas about the fertility of woman analogous to those of the primitive Chaldeans, whereas these ideas would seem to have no place in the inspiration of Magdalenian artists. The motives inspiring the artists of these two epochs are therefore very different.

The Aurignacian figurines present a marked steatopygous character (Fig. 100, Nos. 1 and 3) linking them on the one hand very closely with the ceramic statuettes of the valley

of the Nile and Chaldea, and, on the other hand, with the physical form of the Hottentots. We thus find ourselves dealing either with conceptions of a religious character or with faithful representations of nature. Nevertheless, slenderer models approaching the normal feminine

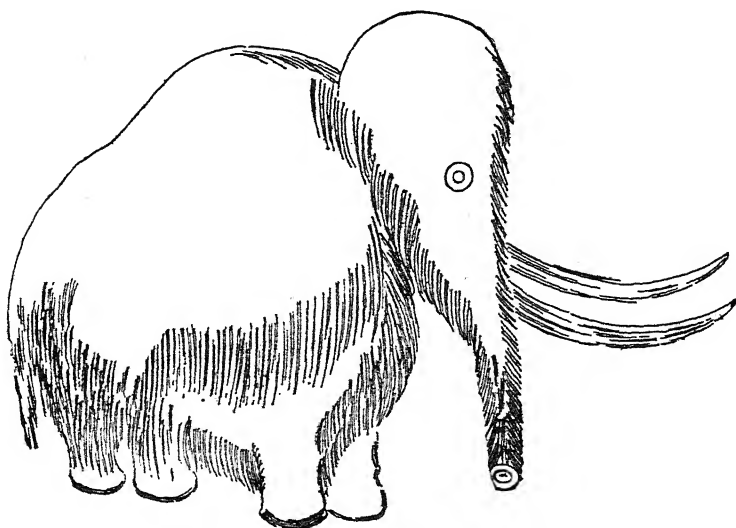


FIG. 102. Mammoth (Font de Gaume).

form (Fig. 100, No. 4), have been found in the same layer at Bassempouy, as also a figurine of a young woman with long hair (Fig. 100, No. 2). These sculptures, especially the head of the young woman, show genuine talent. They are much superior to the human representations left by the Magdalenians (Fig. 100, No. 5), for in their times we find only crude pictures graven on bone, ivory (Fig. 101, Nos. 1 to 4), or rock (Fig. 101, Nos. 5 and 6). It will be noticed, moreover, that both men and women appear to be covered with long fur¹ and that their hair does not seem to be crimped as in the Willendorf Aurignacian statuette. Hence the ethnic types serving as models were not identical.

* Among the numerous Magdalenian drawings and sculptures on bone and ivory which we possess, there are very

¹ H. Breuil (*in lit.* Jan. 10th, 1923) thinks that this is simply hatching and does not represent hair.

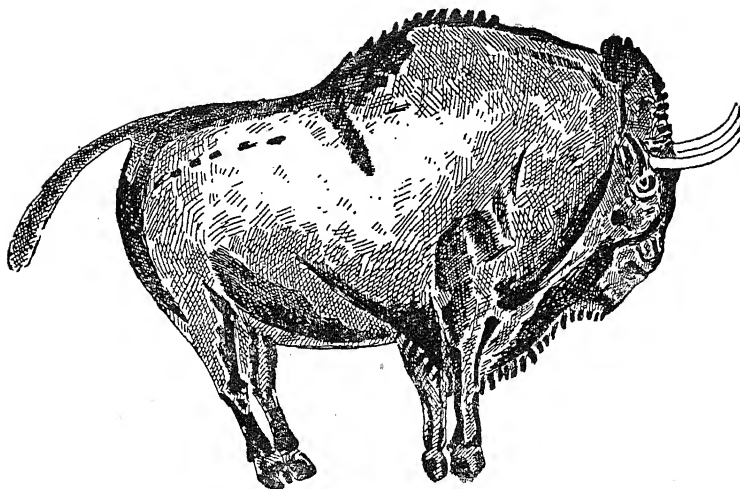


FIG. 103. Bison (Altamira).

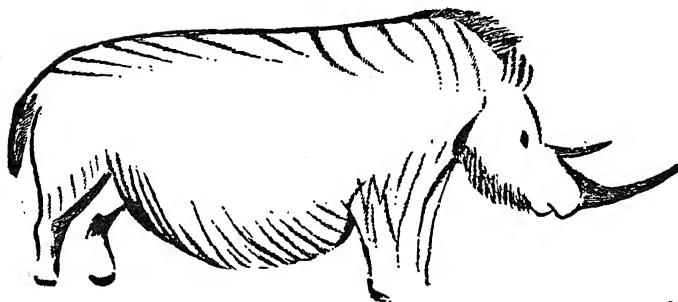


FIG. 104. *Rhinoceros tichorinus* (Font de Gaume).

few in which the human form is represented, and these few are highly barbaric. The Magdalenian, who, as we shall see, was a past-master in the representation of animals, showed himself extraordinarily unskilled in the anatomical drawing of man. Therein, perhaps, lies the explanation of the extreme rarity of human figuration.

Except for a few deer in stone discovered at Solutré, all the animal representations known at present belong to Magdalenian culture, and are sculptured, graven or painted. In the first case, they decorate the implements in common



FIG. 105. Bear incised on a pebble. Grotte de Massat (Ariège), one-half natural size.

use and are of small size; in the second, they are either of medium dimensions, outlined on plaques of stone, ivory, bone, or horn, or they are graven on rocks, and are of all sizes up to life-size, even when large animals are represented.

The number of these animal sculptures, gravings, and paintings already known is considerable—thanks largely to the wonderful finds of the Abbé Breuil and Obermaier—and almost daily new caves are discovered whose walls are covered with paintings. In the gravings and the paintings the figures are generally done one on top of the other, the artist failing to respect the subject already outlined on the surface he had chosen. This results in frequent confusion of different subjects. Elsewhere the subjects are isolated, just as in sculpture. Compositions are also known in which groups of animals are associated, and in which the individuals no longer belong to a jumble of different drawings.¹

The Mammoth, which is found sculptured, graven on ivory, and painted on the cavern walls (Fig. 102), is represented with a thick fleece and armed with powerful tusks.

¹ Cartailhac, VI (1903), 180.

The squat form is generally exaggerated in the drawing in order to give an impression of massiveness.

The Bison, very frequent in the caves (Fig. 103), usually represented in natural size, and sometimes in large herds, is generally very cleverly done. The great neck with the small head sunk into the shoulders, gives the impression of tremendous force. The horns are menacing, and the slender legs are marvellously expressive of the agility and rapidity of



FIG. 106. Wild boar (Altamira).

movement of this great ruminant, which was the favourite game of the Magdalenian hunters.

Next we have the Rhinoceros (*R. tichorinus*) (Fig. 104), which is more rarely depicted, but whose form is skilfully rendered. With its long body, its short limbs, and its two long horns, this denizen of the forests is to this day a terrible fighter. The skin of the Rhinoceros was proof against bullets till recent improvements in the rifle, and we may well wonder how Quaternary Man, scantily armed as he was, mastered this dangerous beast.

The Bear, though common in those days, seldom figures in the caves (Fig. 105), but the rare examples of incised drawings of it that we possess are none the less most exact. The salient characters of the animal are rendered in a few strokes, and even its highly characteristic attitude is reproduced with surprising fidelity.

The wild Boar (Fig. 106) is not very common in the

cave paintings. The example we reproduce, after H. Breuil, is painted in the Altamira caves, and shows the animal charging or running away. The proportions are happy, and the action very cleverly rendered.

Cervus elaphus (Figs. 107, 108), abundant at that period, and a great resource for the hunters, appears on a multitude of objects, sculptured or incised, and painted on rock walls. This animal is always admirably rendered no matter in what position, and a modern artist would have difficulty in giving to it the living quality we find in most of the Quaternary drawings.

The Roe-deer (Fig. 109) is rarely represented, but in such



FIG. 107. *Cervus elaphus* (Altamira).

drawings of it as we possess, the proportions are happy and the attitude good.

The Horse, one of the most widely distributed animals of the period, sometimes does duty for decoration of very nearly an entire cavern. It is seen under every aspect, in repose and galloping (Fig. 110), alone or in herds, and in every case it is drawn with accuracy. In sculpture (Fig. 111), it cannot have the same movement as in drawings, but its proportions are well kept. A head from the Mas d'Azil shows a horse neighing (Fig. 112). This piece of sculpture is one of the most remarkable among the art objects of Quaternary times which have come down to us.

The Wolf, though rare, also figures in the caverns

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(Fig. 113), and is in no way inferior to the other representations of animals either in the accuracy with which it is drawn, or in the rendering of its action.

All the larger beasts inhabiting France at this period are represented: *Bos urus* and Bison, wild Goat, Saiga, Deer, Chamois, Goat, Elk, wild Boar, Bear, Fox, Glutton, and Seal are incised on the rocks side by side with the great pachyderms, the Rhinoceros and the Horse. These representations on the cavern walls would seem to be more or less contemporaneous. As new drawings, however, are very often made on top of the old ones, we may well believe

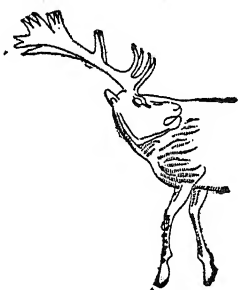


Fig. 108. *Cervus elaphus*, Lorthet Cave. Piette collection (Musée de Saint-Germain). Incised on reindeer horn.



FIG. 109. Reindeer (Font de Gaume).

that various types have been figured in succession, according as they predominate in the valleys and the forests.

Fishes were not forgotten by these artists. We find gravings of them (Fig. 114), and we recognize the Pike, the Trout, and the Eel.

Plants (Fig. 115), on the other hand, are poorly represented in the art of the caves. We can only quote a few rare incised drawings figuring plants we are unable to identify. Further, the artistic feeling of all primitive peoples finds expression in the animal form, but very rarely in that of plants, which, since they render to man but secondary services, and could be got without a struggle, attracted less attention than animals which had to be pursued and overcome before either their meat, or the skins, ivory, horns, and other parts out of which the utensils of daily existence were then made, could be obtained.

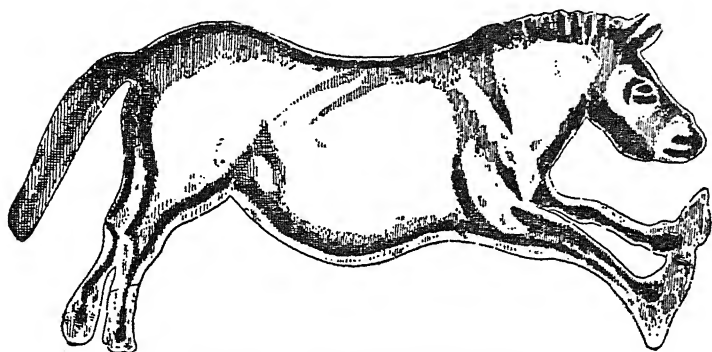
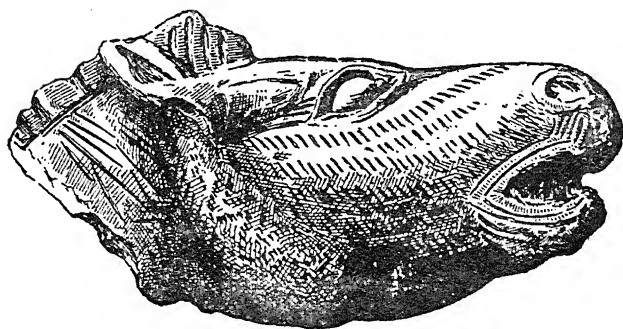
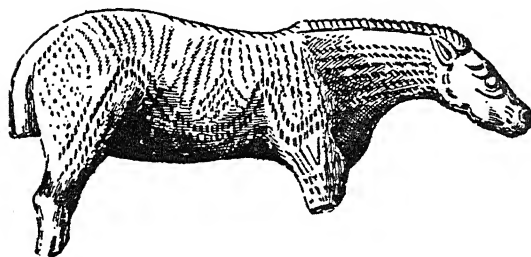


FIG. 110. Horse (Font de Gaume).



FIGS. 111 and 112. Horses: 1, Grotte des Espeluges (Lourdes),
Magdalenian; 2, Mas d'Azil.

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But the Magdalenians did not only copy nature; they went further in their artistic progress and introduced geometric ornamentation into their decoration. This, in a people acquainted with great art, is a product of conventionalization (Fig. 116), but in those ignorant of how to observe nature and to record what they see in a drawing, it betokens the efforts of artistic infancy.

In this geometric ornament the spiral appears, and its



FIG. 113. Wolf. (Font de Gaume).

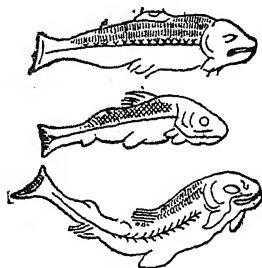


FIG. 114. Fishes (Lorthet).

presence in Quaternary times brings to nothing every theory of its migration at later epochs.

Geometric decoration is not frequent, but it is found incised on bone and reindeer antler, and probably entered into tattooing, corporeal painting, and personal ornaments, and it is likely that the skins these people wore as a protection against the intense cold of the period were also decorated with painted geometric ornament.

Here we are brought to a standstill in our knowledge of Quaternary art, but before leaving the subject we must add a few words on the technical processes then employed in sculpture, graving and painting.

The materials used for sculpture were (Fig. 117) mammoth ivory, bone, the antlers of stags and reindeer, soft rocks, such as steatite, gypseous alabaster, limestone, and other substances easily incised with a flint.

The workman made great use of the saw to cut bone and detach from pieces of ivory those long splinters which he transformed into needles, pins, bodkins or punches, and even

daggers. The scraper and the notched blades made this work possible; then he took his saw again to cut the geometric ornament, and the graving-tool to incise curved lines. A wide selection of implements of diverse forms was necessary for carving hard material, but flint was there to hand, and the workman fashioned it according to his needs.

To-day we possess only those pictures outlined on cavern

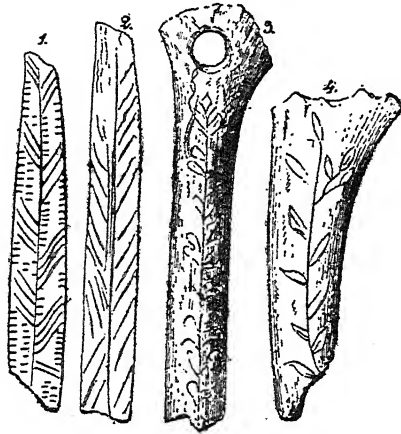


FIG. 115. Plants: 1 and 2, Laugerie Basse; 3, Le Veyrier (Haute-Savoie); 4, Grotte du trilobite (Yonne).

walls, and thus protected from weathering. But it is probable that the rocks outside and the cliffs also bore representations, probably less confused than those of the caves, because the artist, having large surfaces at his disposal, was not constrained, as in the caves, to draw on the top of older representations.

These open-air works of art, common to all primitive peoples, and traces of which are found in every country of the world, are now lost in our part of the globe.

If we may judge by the representations of our caves, the artist probably sketched in his subject in charcoal or ochre. Then he fixed his outlines with a flint graving-tool without inscribing them deeply, and finally he coloured his work with a mixture either of red ochre or black manganese ore with oil or fat, or even water. In these paintings there are only

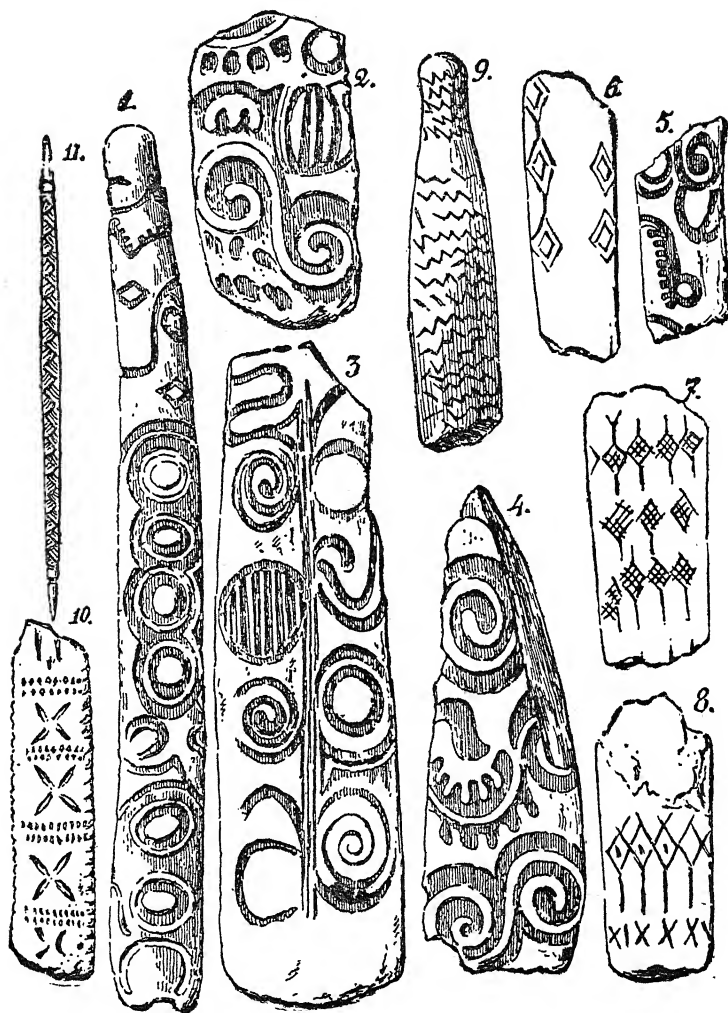


FIG. 116. Magdalenian geometric drawings: 1, 2, 5, Lourdes; 3, 4, Les Espelongues d'Arudy (Hautes-Pyrénées); 6, 7, 8, 9, Laugerie Basse (Dordogne); 10, Marsoulas (Haute-Garonne); 11, Saint-Marcel (Indre).

two colours, red and black, which, when mixed, give brown. We never see green or blue, which could, however, have been obtained from copper ores; but let us not forget that the mineral colours only could have outlasted the ages, and that all colours obtained from organic animal or vegetable substances would have disappeared. We can therefore form a clear idea of the art of drawing, but the colouring escapes us. Such colouring must have played a considerable rôle in the art of the cavern-painter for it permitted him to work on a wall already covered with figures, which he could easily have obliterated by washing and then covering them over with bright colours. Thus is explained the confusion of representations on the rock walls of the caves.

We know that all oriental rugs are coloured with dyes of vegetable origin, and that even now in our dye industries, in spite of the discoveries of chemistry, vegetable dyes still play an important part.

It should be observed that the Magdalenians did not content themselves with purely artistic works, but that they adapted their art to the decoration of common objects, as did the Chaldeans, the primitive Greeks and Egyptians, the Mexicans, the Australians, the Mincopies, and the Hyperboreans. In fact barbaric peoples applied art for the most part to the objects of daily life. We have obtained from the caverns numerous implements and weapons in which the artistic motifs, carefully executed, are often deformed and cramped by the necessities of the use to which the objects were put. Similarly, in most of the Japanese and Chinese ivories the decorative subject either yields to the original shape of the material or has to be adapted to the way in which the implement is used. It is forcibly brought home to one that these primitive artistic conceptions have all arisen among the people who have left us evidence of them, and that, inspired by a practical spirit, such conceptions have nothing in common.

With the close of Magdalenian industry the arts suddenly disappear without our being able to ascertain the precise cause. Very few further efforts remained to be made in the study of the human form, or of forms belonging to the vegetable kingdom, and the peoples of the European West might have achieved *great Art*; for they were certainly better

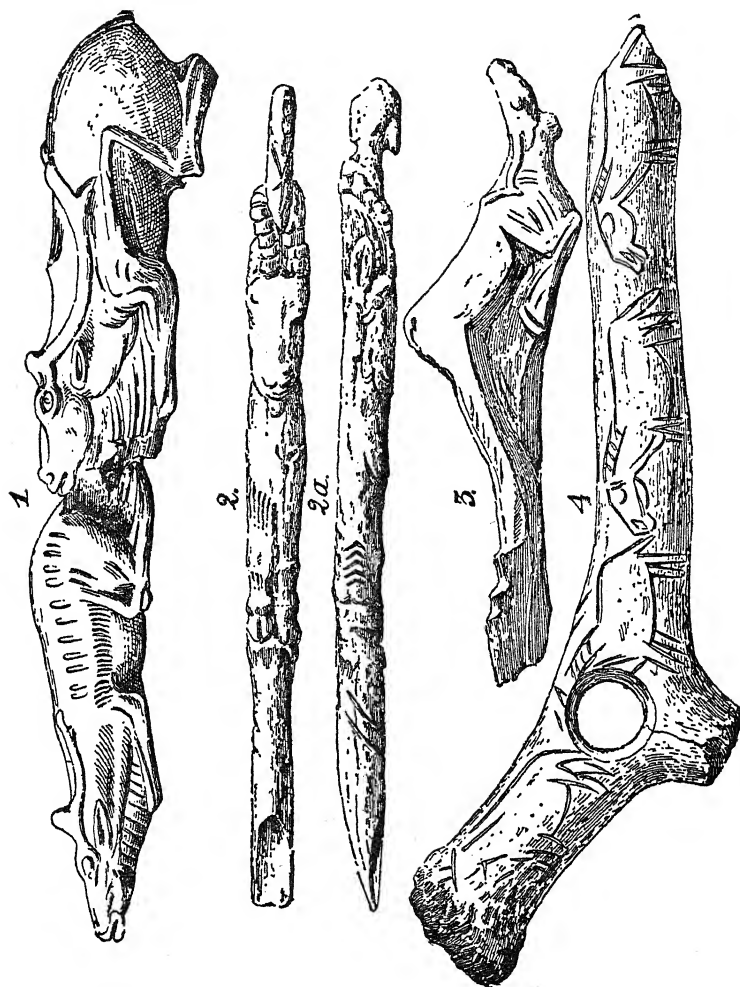


FIG. 117. Quaternary sculptures: 1, Bruniquel (Tarn-et-Garonne); 2, Mas d'Azil (Ariège); 3, Laugerie Basse (Dordogne); 4, La Madeleine (Dordogne).

endowed than those peoples (Chaldeans, Egyptians, and even Hellenes) from whom we have received the principles of modern art. Not only did they possess in the highest degree a genius for observation, but they had also arrived at the conception of expressing form by processes simplified to the last degree. Like the Japanese, the Egyptians, and especially the Greeks of the great period, the Magdalenian knew well how to render an impression by a single stroke. Detail, which, both with the Orientals and ourselves, has been so prejudicial to æsthetic expression, was for him secondary. With these artists line and attitude were dominant. The disappearance of Magdalenian art was a great misfortune for humanity, which, without this disaster, would have progressed rapidly, and the great period of the century of Pericles would have arrived, possibly some thousand years sooner.

Hitherto our observations on Quaternary art have been confined to Western Europe. It is probable, however, that the area occupied by the Magdalenian artists was not of very great extent, for the peoples occupying the Mediterranean basin did not all belong to races susceptible of profiting by the teaching and example of a more highly gifted people. The disappearance of this already well-developed school shows that, if, as appears probable, it were due to invasion, the new arrivals were not capable of assimilating artistic progress. Was it not the same when the Germanic tribes precipitated themselves on the Roman Empire? If, at that epoch, the arts did not entirely disappear, it was because the great majority of that large population remained Græco-Latin in spirit.

Leaving Quaternary western European art, we must go East to find again the arts, for in our part of the world æsthetic feeling had disappeared, and the manifestations so wanting in form which, after a long hiatus, succeeded to the art of the caves, belong to the days of neolithic industry; in other words, they are much later than the earliest artistic manifestations of Chaldea, Elam, and Egypt.

As we have said, the first men who established themselves on the low hills that were later to be built over by the great city of Susa, Elam's capital, had a knowledge of copper and made weapons of it though they still chipped flint and obsidian. These colonists were of an advanced

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culture, for they wore textiles—the oxide of the copper axe-heads found in their tombs has preserved the imprints. They were agriculturalists and cattle-raisers, and showed themselves highly skilled in the manufacture of stone vases. Not only steatite and both calcareous and gypseous alabaster, but the hardest rocks yielded to their chisels. And, finally, they were responsible for one of the finest of the ceramic arts of human prehistory.

The proto-Susian vases, made of a fine paste, are turned, and extremely regular and elegant in form. They are

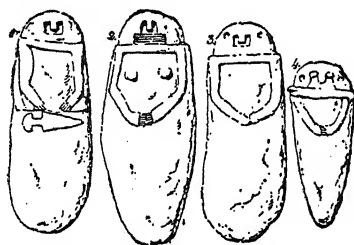


FIG. 118. Bronze industry, human representations (Italy).

covered with delicate paintings, black or brown according to the degree of baking, the subjects being highly conventionalized (Fig. 119, Nos. 1 to 7), animals and plants, and thus removed by many centuries of time from a primitive naturalism. All the sepultures of the primitive necropolis of Susa contain these vases but no other kind of pottery. However, the deepest layers a few metres only above the undisturbed gravel beds, often contain shreds of incised pottery (Fig. 119, Nos. 8 and 9), decorated with those primitive geometric designs we are accustomed to classify as belonging to neolithic industry, and made of coarse half-baked paste. Evidently the proto-Susians had retained the old-time models for everyday use, but they did not consider them sufficiently precious to accompany their dead into another life. It would seem likely that the conventionalized animals and plants on these sepulchral vases were done with some religious or magical intent; we shall return to this subject later when considering philosophic conceptions (Ch. XIV).

It was neither in Susiana nor Chaldea that this interesting ceramic art was born. It arrived on the banks of the Kerkha

already fully developed, and does not depict animals which at that time frequented Mesopotamia, such as the Hippopotamus, Rhinoceros, and possibly the Elephant. Its princi-



FIG. 119. Nos. 1-7, first phase of Susian painted pottery ;
Nos. 8 and 9, rustic incised pottery.

pal motif is the long-horned mountain Goat unknown in Chaldea and the Elamite plain, but still common in all the mountain ranges of Western Asia. We must therefore conclude that the first rudiments of this proto-Susian art had their beginnings elsewhere, in a mountain district. But in what district we do not yet know. Nevertheless, the presence of copper indicates the northern massif. The mountainous

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district comprising Anatolia, Armenia, and Transcaucasia, in our opinion the cradle of metallurgy.

This beautiful pottery is succeeded by that of quite another school. The paste is coarser, the painting less fast, but in two colours, red and brown ; and naturalism is again in evidence side by side with geometric decoration. We still find conventionalization (Fig. 120), but brought to such a pitch that the subjects become incomprehensible (cf. Fig. 120,



FIG. 120. Second phase of Susian painted pottery.

right-hand vase). These vases are occasionally of great size, and we find them both at Susa and Tepeh Aly Abad in the Pusht-i-Kuh.

After this second phase, ceramic painting slowly but surely disappeared for ever from Elam. At the period of its birth, history was not yet, and it was only in the layers at a much higher level in the ruins of Susa that the most ancient texts of the Patesis¹ appeared.

The first phase of this pottery would seem to have been peculiar to Elam, but we find traces of the second phase in Chaldea, in Luristan, in Bactria, and as far as the tells of the south-west of the Iranian plateau. Apparently it was

¹ King-Priests.

widely distributed, for, towards the west, it appears at least to have influenced Palestine (Fig. 121) and Phœnicia.

What was the cause of the disappearance of these arts? We do not know, and are reduced to conjecture. No transitional phase, linking these two schools of painted pottery, has come to light, and the final school dies out gradually only and does not altogether disappear until after the dawn of history. Pottier, however, considers the second to be derived from the first. When we come to the subject of writing we shall find that another custom peculiar to Elam was to survive for a few hundred years more—namely, the use of proto-Elamitic signs that, little by little, was supplanted

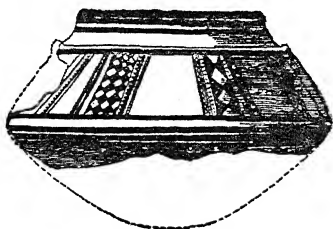


FIG. 121 Painted vase, Palestine.

by Semitic writing, a fact suggesting that the second ceramic school died out on the arrival of the Semites in Lower Chaldea and Elam. The Semitic conquest took place at a very remote epoch, because it occurred when polished stone was still used in Elam, along with copper and occasional bronze.

If in Elam painted vases of the second phase ceased to be made, it was otherwise in the rest of Western Asia, where the art was widely distributed. We find traces of it in Assyria,¹ Palestine and Syria,² Cappadocia,³ and in the Ægean Islands. Herein lies a knotty problem only to be solved by chronology. Did the technique of painted vases come into Syria from Chaldea, or from Crete as many archæologists believe?

Considerable indecision prevails in the chronological estimates made for the early history of Egypt, Chaldea, the

¹ Cf. Helbig, 1875. *Ann. de l'Institut. de Corresp. archéol.*, p. 221; **XLIII**, III, 1885.

² **LXV**, ch. v, 297.

³ According to J. Garstang.

Asiatic coast, and the islands of the Mediterranean. Putting on one side all the debatable dates, are we not justified in thinking that an art so widely distributed as to reach in the east the region of Ispahan and Hamadan, could never have originated in the centre of the Mediterranean, and that we should rather seek its birthplace in Susiana? The pottery of Palestine and Syria, moreover, presents greater affinities with the ceramic industry of prehistoric Elam than with that of the Islands.

Thus ceramic art in Elam is highly conventional from its inception and presents a character peculiar to the country. It has its roots in naturalism, and is embellished with certain geometrical motifs; but the greater number of these may be but conventionalizations whose origin we do not grasp.

In the valley of the Nile¹ we meet in neolithic and eneolithic industry a pottery that is quite as remarkable as that of Elam, not for its paste, but by reason of its form and decoration. The technique of the Egyptian painting, however, differs completely from that of Susa. Here the vase is no longer covered by a fired glaze, but is cold painted, doubtless with colour ground and mixed with oil, fat or glue, and the organic materials having been destroyed by time, there remains but a powdery layer. It must not be forgotten that these vases were destined for sepulchral and not household use. The decorative subjects are of great variety. Certain types, whose form is modelled on the stone vases so common in Egypt at the time, are sometimes speckled in imitation of the crystals of hard rocks (Fig. 122, Nos. 1, 2 and 3), or decorated with spirals suggested by nummulitic limestones (Fig. 122, Nos. 4 and 8), or with veins suggesting agate and cornelian (Fig. 122, Nos. 12 and 15), common minerals of the desert. But more frequently the funerary vase paintings represent the ship of the dead (Fig. 122, No. 18; Fig. 123, Nos. 1, 2, 3 and 9), ritual dances (Fig. 123, No. 1), libation vases (Fig. 123, Nos. 8 and 9), or scenes from daily life. Thus we may see the first steps taken in that artistic practice which was to develop into the decoration of the mastabas of the old Empire.

¹ Cf. XXXIX.

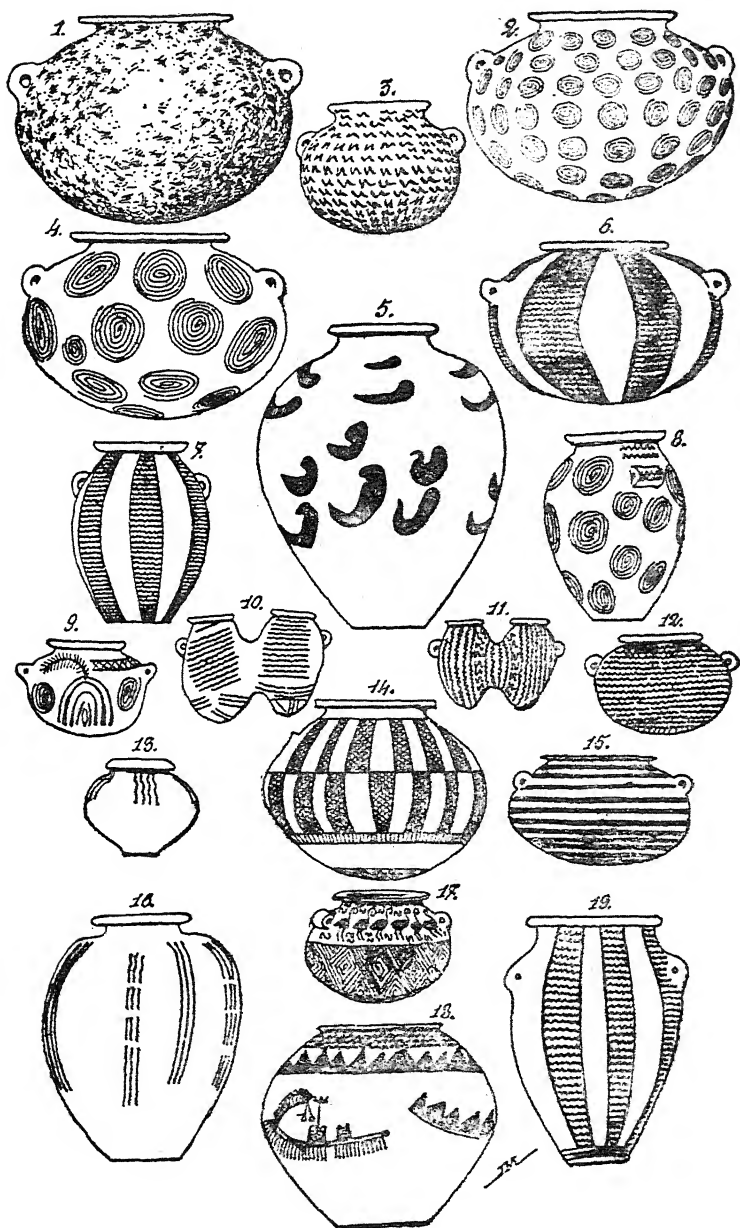


FIG. 122. Pre-dynastic Egyptian Pottery.

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But ceramic art in Egypt went further than this. In neolithic and eneolithic graves, as in the kitchen middens, we find glossed red vases, with black borders, in great numbers, and others, thickly coated with a smooth red glaze,

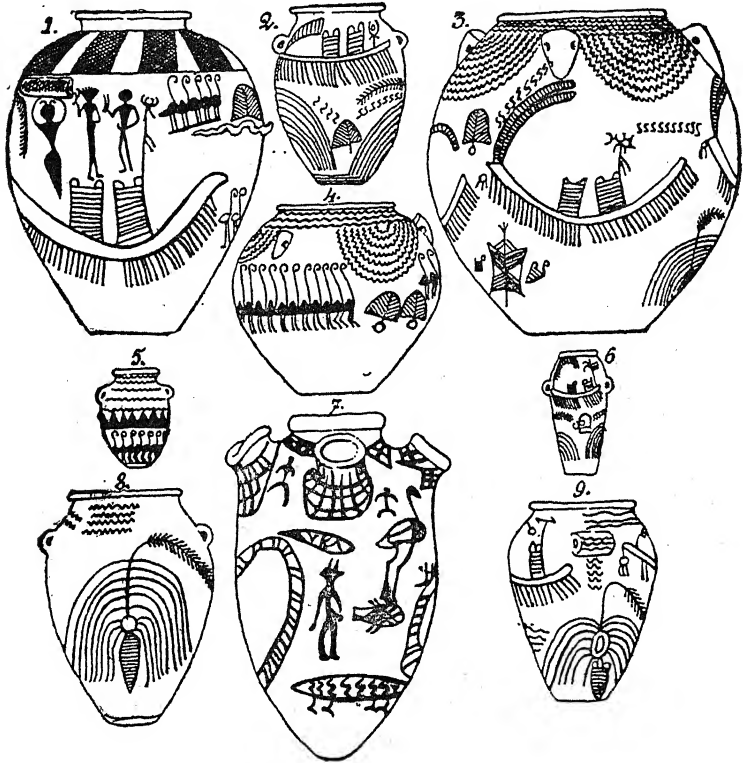


FIG. 123. Pre-dynastic Egyptian painted Pottery.

and having a white painted decoration fired on—a process also seen in the Mediterranean Islands. Finally, we find the paste incised, both with and without any filling of the incisions ; such vases, though rare, are still found in the time of King Seneferu ; that is to say, up to the close of the third dynasty.

With the appearance of the first Pharaohs, the red-painted pottery suddenly ceased. We have called attention to a similar happening in Elam where the second phase of painted vases is succeeded by a crude pottery. The working

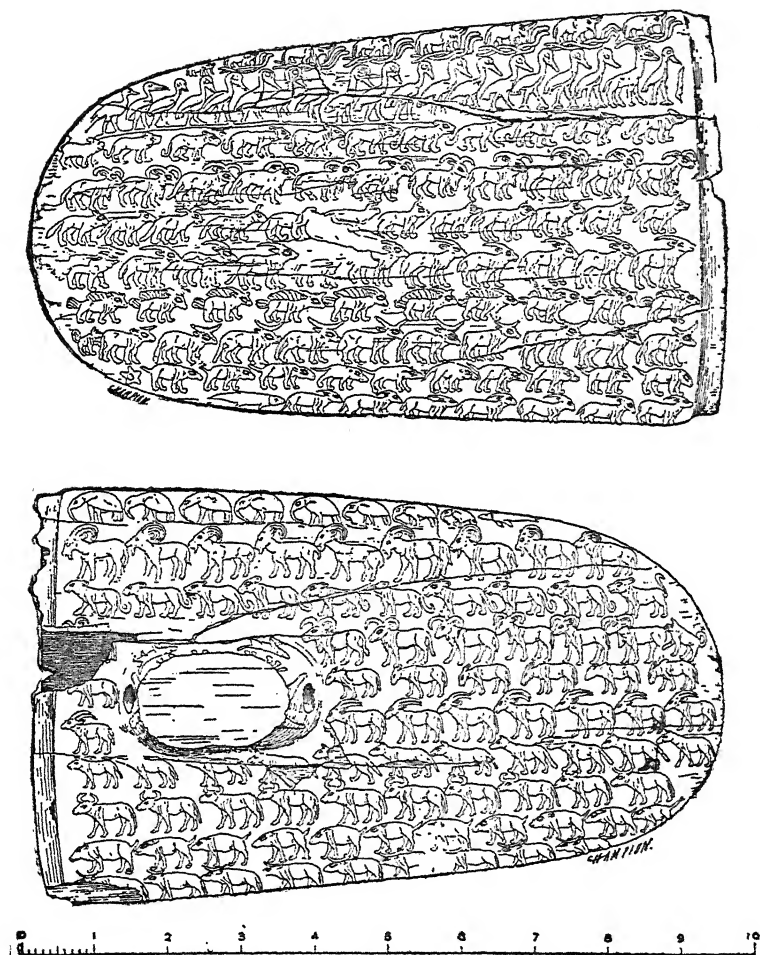


FIG. 124. Ivory handle of flint dagger, showing the fauna of Egypt at the beginning of the Pharaonic regime (discovered by Henri de Morgan at Hassaya, near Edfu). Rows, beginning at the top: 1, Elephants; 2, Ostriches and Giraffes; 3, Panthers; 4, Goats; 5, Jackals; 6, Antelopes; 7, Porcupines; 8, Oxen; 9, Hippopotamuses; 10, Antelopes; 11, Elephants and Salmon; 12, Goats; 13, Panthers; 14, Goats and Dog; 15, Asses; 16, Antelopes; 17, Dogs and Jackals; 18, Oxen; 19, Hogs or Wild Boars; 20, Oxen.

of hard stone dominated Egypt at the beginning of the Ancient Empire; it was at its zenith about the time that painted pottery ceases to be in evidence. The tomb at Nakadah and those at Abydos contain veritable marvels of lapidary art—little vases in rock crystal, milky quartz, cornelian, agate, and even in obsidian, a substance no longer used to-day because of its extreme fragility—but all, unfortunately, in fragments. These tombs contain no painted vases.

We saw that the pre-pharaonic people had great skill in the working of ivory and stone, and that they ably sculptured and graved a number of animal and human figures. We need only mention here the ivory handle of a flint dagger discovered by Henri de Morgan in the necropolis of Hassaya near Edfu. The entire surface of this magnificent piece is covered with animal figures, and the entire fauna of the Egypt of those days is portrayed (Fig. 124).

If the people of Egypt in eneolithic times were experts in the working of rocks and ivory, they were equally skilled in metal work. Another stone knife, with its handle covered with sheet-gold, proves that they were skilled in gold repoussé work (Fig. 125).

All these early Egyptian works of art demonstrate great freedom of style, but with the passage of time they get further and further away from nature. The explanation lies in the freedom of the artist of neolithic and eneolithic times from the religious canons which gradually shaped the highly-specialized art of the times of the Pharaohs. This evolution took place early, and was already accomplished in the third dynasty; thenceforward, both drawing and sculpture were governed in the minutest detail by immutable laws. This convention, peculiar to Egypt, became more and more accentuated up to the time when Rome became mistress of the valley of the Nile. Thus the more natural and broadly-conceived works of art belong to the Ancient Empire.

We meet again in the vases of the Mediterranean Islands the same technique described in connection with Elam and Egypt, always excepting the fragile red painting of the Upper Nile valley. In the Islands these different varieties of pottery are associated with neolithic industry, which would seem to have been the stage of culture arrived at by the first inhabitants of Crete, Cyprus, and all those lands

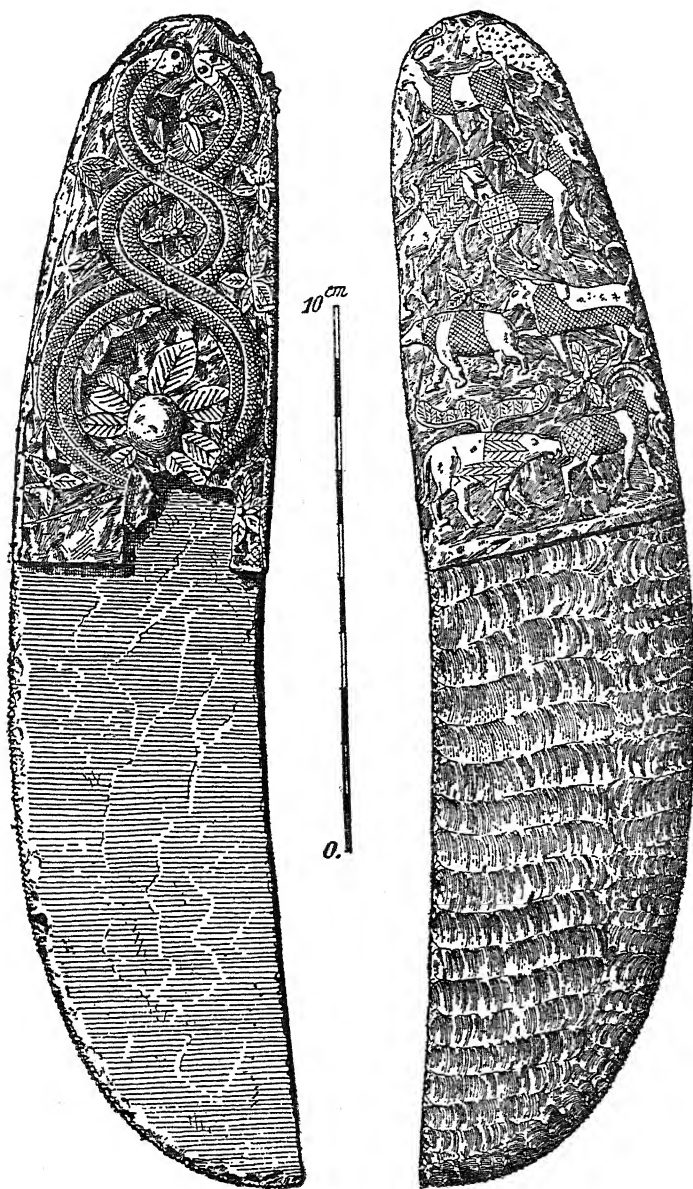


FIG. 125. Knife in yellow flint with gold-leaf repoussé handle. Necropolis of Saghel-el-Baglieh (?), Upper Egypt (Cairo Museum).

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which were later to become the domain of the Hellenes. They bear witness to a potter's craft still in its infancy (Figs. 126 and 127), and here, too, the first artistic essays began with metal. But if the technique of the Mediterranean world was the same as that of Asia and Egypt, from the very earliest phase of ceramic painting (Fig. 128), its artistic taste was quite different.

Although the Ægæo-Mycenæan world had been largely influenced by Egypt and Asia, it showed, nevertheless, a well-marked individual taste. Naturalism was the basis of most of the artistic work, but its tendencies were peculiar,



FIG. 126. Incised Pottery: Cyclades.

differing not only from those we have described above, but totally foreign to those of Quaternary times in Western Europe. We shall not here enlarge on this subject, which will be treated in full detail in another volume of this series. These arts played a great part in all Mediterranean countries, in Italy, Spain, and Gaul, and even in Central Europe.

Before speaking of Europe, let us glance eastwards once more at Northern Persia and Transcaucasia, regions in which ceramic art differs completely from that of Chaldea, Elam, Phœnicia, and Greece, but regions, also, which share the artistic ideas of the northern peoples and have considerably influenced European culture. And this independently of Mediterranean influences, because many of the Caucasian peoples, and still more, the Asiatic peoples, once formed part of those groups, portions of which invaded Europe, while others settled by the way.

When we leave the Mediterranean to penetrate into the heart of Asia in northern Persia, Transcaucasia, and Siberia, we are confronted with two quite distinct artistic conceptions, one corresponding to the copper and bronze industry of the dolmens of northern Iran, and having only a simple geometric decoration, the other having animal figures as its principal decorative motif. This latter art is met with in Ossethia (Fig. 131), in the Russia and Persian Talish, and in Russian Armenia, in association with iron (Fig. 132). The spiral now becomes prominent, and the swastika more common than in earlier times.

In the Siberian districts of Minusinsk and Krasnoyarsk,

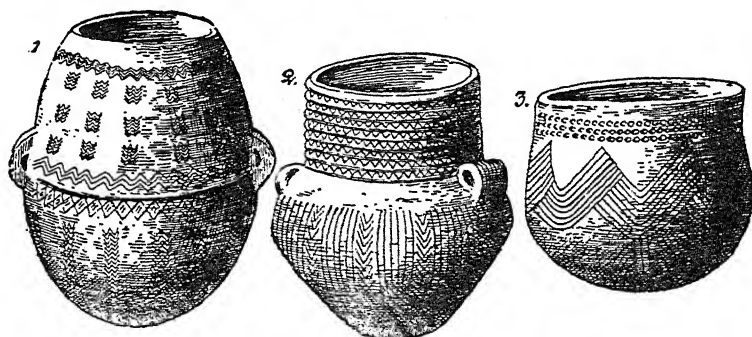


FIG. 127. Incised Pottery, *Aegean Islands.

towards the frontiers of Mongolia, in the Altai, and as far as the Ural and the Volga, localities where copper ore is common, there have been found, both isolated and in the burial-places, numerous objects in which animal figures predominate in the decoration. These figures are either moulded, forming part of the implement or weapon, take the form of statuettes, or are engraved on the metal of such objects as axe-heads, daggers, vases, and metal belts. Artistic taste and technical manner are identical with that evidenced in the work of the Persian engravers of to-day. We are tempted to see in the appearance of this highly-characteristic art which came to supplant geometric decoration an indication of the arrival on the Persian plateau of the Iranians among those peoples of unknown origin of which the texts of the kings of Assur speak.

We have to recognize that this naturalistic art would seem never to have penetrated into Chaldea, Assyria, Egypt, or the western world. There is no question, therefore, of its intervention as an influence in the development of Mediterranean naturalism (Fig. 129).

But if we compare its general artistic aspect with that



FIG. 128. Vase from Kamares (Crete).

which developed in western lands at the beginning of the iron industry—during the period to which the Hallstatt label has been given—we are struck by the number of analogies between the naturalistic art of the Orient and Occident. The forms of weapons and implements are frequently identical; and the decorative subjects and method of their application, especially engraving, are so similar and are specialized to such a point that we cannot help associating these two arts, which, according to discoveries in the Danube basin and in the Ukraine, would appear to join up north of the Caucasus by way of the Russian steppes.

In Transcaucasia, this iron civilization was preceded by another, more simple, whose art belonged to the geometric system, a civilization which would seem to have been

derived from a bronze culture, whereas in the west the Hallstatt phase directly succeeded the bronze by a rapid transition.

These considerations would lead us to suppose that iron, long known in Asia prior to the arrival of the naturalistic artists, only penetrated into Europe with the Hallstatt people, who came from the Orient by way of the Russian steppes and the valley of the Danube.

We must, nevertheless, take into account those Mediterranean influences which at this epoch probably helped to



FIG. 129. Dog and wild boar, from a fresco in the palace at Tiryns.

modify considerably the customs of the naturalistic artists from Asia.

This industry, with some likelihood, is generally attributed to the Celts. Thus it follows that the Celts, before they came to Europe, must have inhabited or sent colonies into the countries south of the Caspian, either by way of Derbent or Dariel (Ossete districts) from the North, or else from the Transcaspian country, skirting the Elburz mountains, to the Araxes districts. Then the southern branch of the race would either have been absorbed, or would have retreated northwards, leaving their taste and their naturalistic methods—still in force to-day among the Persian graveurs—as a legacy to Iran. The very characteristic Hallstatt art would then have been effaced in Western Europe by a more cultured taste—that of the Mediterranean peoples, which becomes dominant from the La Tène period.

The beginnings of the Hallstatt industry in Europe is placed at the beginning of the first millennium before our era. It must, then, have been earlier still, perhaps by only a few centuries, perhaps by a millennium, that this art appeared in Transcaucasia. Thus the eastern “Hallstattians” in all pro-

bability would have come by the knowledge of iron in Transcaucasia, since it existed in that country before their advent. This would make the Ossete burial-places merely the witness of the passage of the "Hallstattians" through



FIG. 130. Ossete iron industry. Animal figures.

the Great Caucasus, a country where copper in the natural state is much more abundant than iron—thus explaining the rarity of iron in the necropolis of Koban.

These are but conjectures ; still, the wide diffusion of so specialized an art as that of Hallstatt cannot be considered the result of mere coincidence.

Hitherto, unfortunately, research has made but little



FIG. 131. Figures engraved on bronze belts from the necropoles of Russian Armenia. Iron industry.

progress either in Transcaucasia, Persia or Central Asia. Excavations have been made in Ossethia, in Russian Armenia, and in the Russian and Persian Talish—but there our researches end for the moment. Nevertheless, we have discovered that the peoples of the North lived in complete isolation from those of the South, and that the flourishing civilizations of Babylon, Susa, Nineveh and Ecbatana did not influence those peoples whose graves we have discovered in the necropolises of the North.

In the north of Western Asia we find a few rare traces of

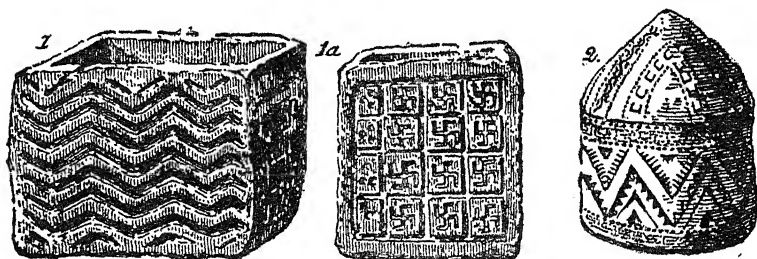


FIG. 132. Incised pottery. Djonu Necropolis (Russian Talish).

a specialized painted pottery in tombs containing iron weapons. Pottery ornamented with designs made by a polisher predominates, and incised ornamentation is fairly common (Fig. 130). With the appearance of iron, we meet with numerous vases in the forms of animals, such as horses, oxen and birds; but here, as with the engraving, we are in the presence of a specialized style—of Altaic origin if we may judge by the discoveries made in Siberia during the last few years.

In Western and Central Europe the earliest stage of ceramic art shows us vessels which are generally wide-topped, flat-bottomed and irregular (Fig. 133), made of a coarse paste, and ill-baked on open hearths. The sherds of this pottery are generally composed of two brownish exterior layers, and a central greyish portion, scarcely baked; the earth of which has hardly been worked into a paste and is mixed with grains of sand.

Later on, as neolithic industry was perfected, the technique of ceramics gradually improved. Forms were elaborated

(Fig. 134) and became at times quite elegant, and decoration appeared. It had already been met with in the shape of incisions during the Campignian industry, and now it was elaborated by means of dotted depressions (Fig. 134, Nos. 9, 10 and 12). Rope-marked vases then appeared (Fig. 134, No. 12); that is to say, the vases were decorated with the impression of a cord twisted round the vase while the paste was still soft; next, the potter used little

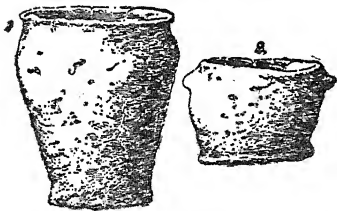


FIG. 133. Rough pottery: 1, Tertre Guérin (Seine-et-Marne); 2, Dolmen of Château-Larcher (Vienne) (after A. de Mortillet).

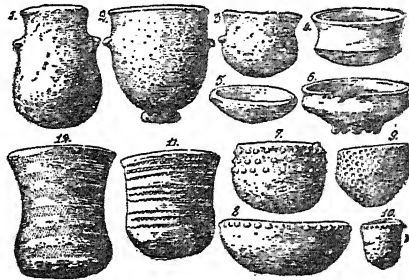


FIG. 134. Neolithic vases: 1 to 3 and 5 to 10, Chassy (Saône-et-Loire); 6, Bohemia; 4, 11 and 12, Brittany.

pellets of clay pressed into the soft vase to make designs (Fig. 134, Nos. 5, 7 and 8). This was exceptional only, for in nearly every country incised ornament predominated; at times it became very artistic, as in Scandinavia, where it was particularly remarkable from the days of polished stone. With the advent of bronze, pottery improved still further; the potter's wheel had then long been in use, and gradually the shapes of the vases became inspired by those of the Hellenic world. In southern Italy, Sicily, Spain, and even southern Gaul, the Mediterranean arts had exercised great influence on the West ever since the Cretan zenith, and Mycenæan forms (Figs. 138, 139) spread overland into Central Europe. So much was this the case that, from the time when iron appeared, the vase forms, the subject of the designs, and the technical processes had become hybrid, deriving both from native culture and from Mediterranean art. Vases were painted, but without the skill of the Hellenic peoples, and, as a rule, these efforts of the potter were merely rather unstable colour tracings over the incised decoration.

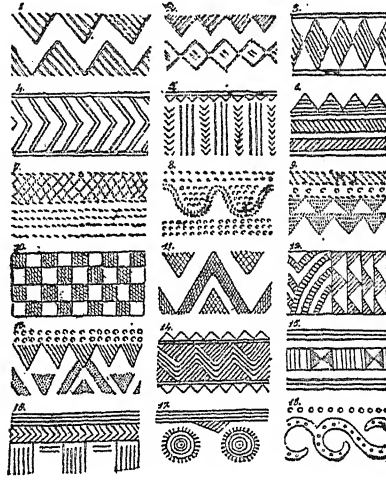


FIG. 135. Neolithic decoration on pottery.

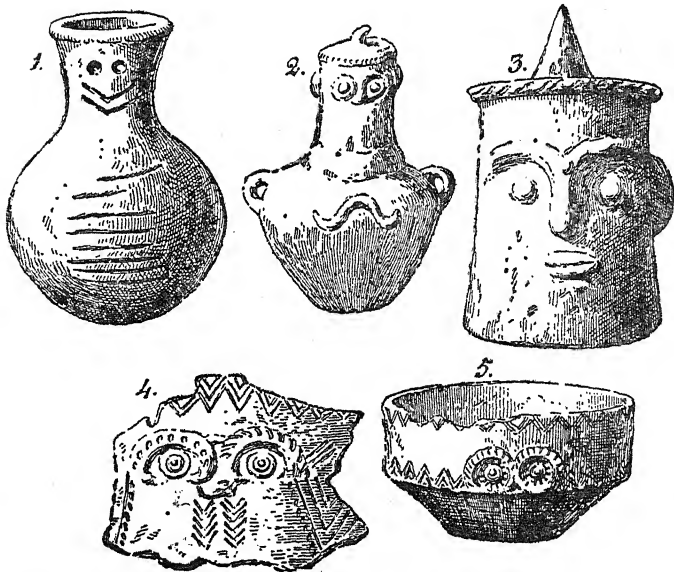


FIG. 136. 1, 2, Cyprus; 3, Hissarlik; 4, Isle of Mœn (Denmark); 5, Zeeland.

The Mediterranean influence made itself felt throughout Europe in later proto-historic times, but it was exercised on peoples highly diverse in origin and artistic feeling, hence a multitude of schools and innumerable varieties resulted, the study of which is further complicated by the migration of populations. In Gaul alone we can recognize a number of different areas, and successive schools for identical districts, the phases of which correspond to the migrations



FIG. 137. The iron industry in Transcaucasia. Vase decoration (Helenendorf, near Yelisavetpol).

of populations, the opening of new commercial routes, military events, and a host of other causes that often escape us.

In the West and in Northern Europe, the prehistoric era came to an end during the development of the iron civilization associated with the La Tène industry. Thenceforward, the arts are the product of native taste largely influenced by Græco-Etruscan and Greek art. The ancient motifs and processes are still seen on the incised vases; but ceramic painting and sculpture are both stamped with a special character derived from Hellenism, which, in the northern districts, survived until the Middle Ages.

On the whole, outside of Elam, Egypt, and the Greek world, where we meet with genuine artistic schools, sharply characterized both by their technique and their expression, the artistic taste of the Ancient World was



FIG. 138. Buchheim (Duchy of Baden).



FIG. 139. Burzenhof (Württemberg).

still most confused, the reason being that nowhere do we find among the numerous peoples of whom we have any trace, the same originality as in the great centres of the East.

But the New World must not be neglected, for certain regions of America—Mexico and Peru—had schools no less



FIG. 140. The arts of the La Tène industry: 1, Turoe (Galway, Ireland); 2, Kermaria, near Pont-l'Abbé (Finistère); 3, Hoch-Redlan (Prussia); 4, Betheny (Marne); 5, Glastonbury (Somerset); 6, Roanne (Loire); 7, Marne; 8, Roanne (Loire); 9a, Matzhausen (Palatinate); 9, animal frieze on 9a.

remarkable than those of Asia and Egypt. Here we are dealing with a world apart, cut off from relations with the rest of the universe and evolving independently. This evolution produced the same results as in the Old World, because in America we find an incised and polished ceramic art showing all the varieties of the old world and culminating in painted pottery. The technical processes are the same: the artistic conceptions alone differ. We can make no reliable estimate of the date of this work.

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What has happened in the New World demonstrates how necessary it is to be wary in our hypotheses relating to influences, especially when processes of a simple order are concerned. The same idea may have come to any number of peoples at different times. The characteristics of primitive unpainted pottery cannot be considered conclusive from the chronological point of view where different peoples or diverse regions are involved.

Moreover, we are still very ignorant of everything relating to the arts, and of ceramics in particular, in the major portion of the Old World. We have seen that for Transcaucasia, Persia, and Russia we possess vague information only, and that limited to a very few districts and peoples—but beyond that, further eastwards, our lack of knowledge is complete.

CHAPTER II

RELIGIOUS BELIEFS, TOTEMISM, AND MAGIC

Two principles would seem to have swayed the minds of men in those far-off days when as yet the Occidental folk of Europe were in the palæolithic and archæolithic industrial phase: respect for the dead, implying a belief in an after-life; and, probably, totemism—applied, as among modern primitive populations, to the issues of mundane existence.

In the Grimaldi caves, and in many others, the dead have been found buried beside their hearths, surrounded by the objects of their intimate daily life. This custom, which remained in vigour up to the close of the polished stone phase, and which was even more marked after the appearance of metals, undoubtedly shows that the early inhabitants of France already cherished a cult of the dead and believed in a future life and hence in a superhuman power. Nor was this notion peculiar to the races inhabiting the Western Europe in Quaternary times; it was universal. But it would appear to be in our caverns that the earliest testimony to such a belief has so far been discovered.

Their totemism is more debatable. Nevertheless, the study of cave paintings and their comparison with the collected data regarding the practices of contemporary uncivilized populations, has led archæologists to consider that the Magdalenians were not prompted to cover the walls of their dwellings with paintings from a single-minded desire to satisfy their æsthetic tastes, but that these representations had a religious significance.¹

"Both in Australia and America," says Déchelette,² "a tribe or group believes itself to be under the protection of a tutelary being, usually an animal that has to be propitiated in the interests of the common weal. Hence the animal totem becomes the object of a regular cult.

¹ Cf. S. Reinach, *l'Art et la Magie*, VI (1903), 257; *id.*, LX, I, Paris, 1905.

² **XXVI**, I, 268.

Totem groups display representations of their totem on their arms and shields. By the intervention of magic the totem can bestow fecundity, so profitable to the community. Spencer, Gillen and Frazer have described the strange ceremonies performed with this object by the Australians at the foot of rocky walls covered with zoomorphic representations. A number of details in these magical practices are easily correlated with facts observed in the caverns of the Pyrenees and Périgord." We must not strain totemism too far, however, by seeking to find its traces everywhere. We do not know all the motives that inspired men's actions in those far-distant days.

The European cave paintings are sometimes placed in corners or on inaccessible parts of the rock, and it has been supposed that they were thus placed because they were forbidden (*Taboo*) to women, children and to uninitiated persons in general.

This is but a plausible hypothesis, but one that it would be as rash to develop as that regarding totemism, for we cannot deduce from the superstitions of modern savages ideas that were current in times so far distant from our own.

The belief in *larvæ*, that is to say in spectres and ghosts, which we meet with in the Italian peninsula from the earliest historic times, is certainly not a conception peculiar to European peoples. It existed in Egypt under another form, but the fear lest the ghosts of the dead should return to disturb the calm of the living undoubtedly had great influence on the respect with which men would always seem to have treated burial-places—ever the object of mysterious dread, unformulated, but intense in primitive peoples, and still extraordinarily vivid in the minds of many highly-developed persons of our own day.

With the appearance of neolithic industry the cult of the dead was emphasized under a number of forms, for the interments of the period, greatly in evidence in every land, are at the same time highly diverse in character.

Simple burial in the ground without any protective wrapping for the body is uncommon in Europe. It is met with, however, in the department of the Marne among others, at Dormans: the bodies, squatting or doubled up, were laid in small graves oriented north—south.

This, the simplest of all modes of sepulture, was customary in the valley of the Nile during the period of neolithic and eneolithic industry (Fig. 141).¹ We often find the skeleton

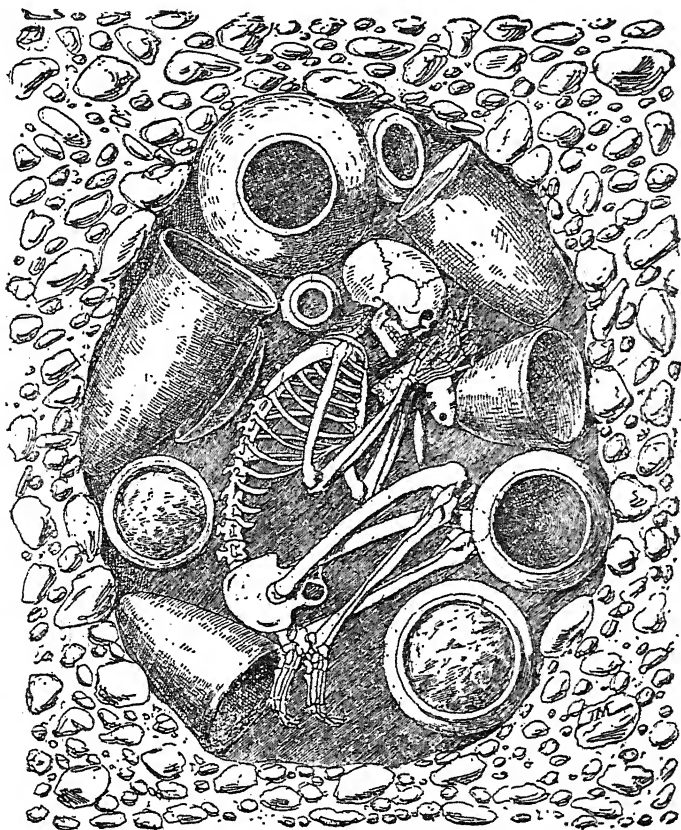


FIG. 141. Neolithic interment, El Amrah (Upper Egypt).

enclosed in a wrapping—sewn into an antelope or gazelle skin—nor does the coming of copper alter this usage. In the deepest deposits of the Tell of Susa the graves present the same general character.

In Germany this method of inhumation is more frequent than in Gaul.

We have seen that in Quaternary times the dead were

¹ Cf. **XXIX**.

frequently interred in the caverns close to their dwelling-place. In neolithic times these caves, uninhabited for the most part at that date, were used as cemeteries, as, for example, the cave of the *Homme Mort* in Lozère, where an extensive ossuary was found. Often a wall of dry stones blocking the cave entrance protected the bodies from beasts of prey.

As, however, natural caves do not exist in every country,

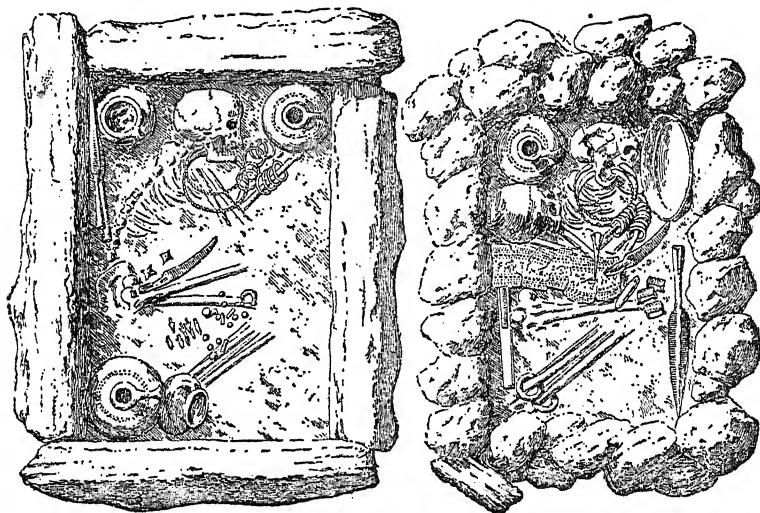


FIG. 142. Graves from the necropoles of Russian Armenia. Iron industry.

men had to dig artificial shelters in the ground. The form of grave can best be studied in the department of the Marne. The valley of the Petit Morin contains a large number.¹ They are veritable hypogea, dug with great precision in the chalk, and made up of one or two chambers, closed in former times by slabs of stone or stout wooden planks. A trench made in the outer débris and the drift formation enabled the diggers to reach the out-cropping chalk. A large number of skeletons were laid carefully one on the top of the other in two rows with a passage left between.²

¹ Baron de Baye, *Sur les cavernes sépulcrales dans le département de la Marne* (*Congr. internat. arch.*, Brussels, 1872); **XXII**, 1st edit., 1879.

² These artificial caves, which are very rich in polished flint implements, contain also some traces of copper; they thus belong to the Eneolithic and not to the Neolithic.

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Certain of these artificial caverns are considered by archæologists¹ to be either funerary chapels intended for the celebration of ritual ceremonies, or tombs reserved for personages of high rank.

Hypogea are fairly common throughout the greater part of Europe, in Mediterranean countries, Egypt, and

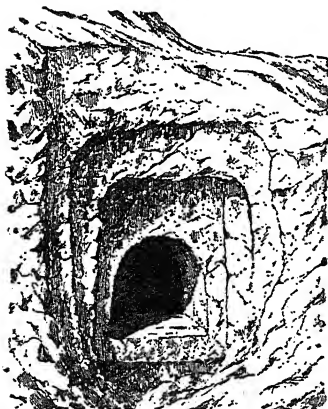


FIG. 143. Crypt of Coizard. Valley of the Petit Morin (after Baron de Baye).

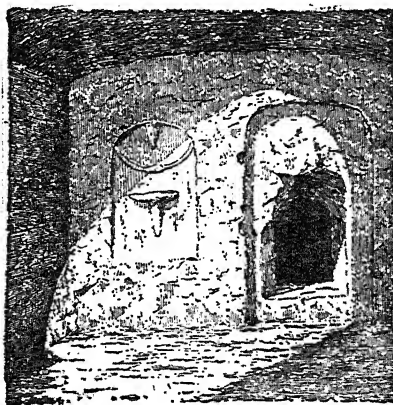


FIG. 144. Crypt of Courgeonnet. Valley of the Petit Morin (after Baron de Baye).

Western Asia ; all are inspired by the same feeling of respect for the dead and desire to protect their remains from beasts and men. The tombs of the Pharaohs at Thebes, and the Achæmenidæan sepultures of Persis are artificial crypts of monumental proportions. The excavation of such hypogea must have entailed great labour only to be undertaken for a very few persons, hence as a mode of burial it must be considered exceptional. The same is true of dolmens, large chambers built of blocks of stone and then, usually, covered over with earth.

A dolmen² (Figs. 145 and 146) is a stone monument of varying dimensions, composed of vertical walls formed of great blocks set on end with one or more large slabs forming the roof. Some dolmens consist of one rectangular chamber only (Figs. 145 and 146, Nos. 1, 3 and 4), others of several

¹ XXIV, 157.

² From *dol*=table and *men*=stone (in Breton).

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(Fig. 146, Nos. 5 and 7); whilst still others have shorter or longer galleries, of varying width and height, leading into them, and constructed on the same principle (Fig. 146, Nos. 1, 3 and 7). Occasionally the lateral walls are inclined and give the dolmen the appearance of a truncated pyramid (Fig. 145, Nos. 4 and 5); galleries are even known in which the covering stones are supported on one side only,

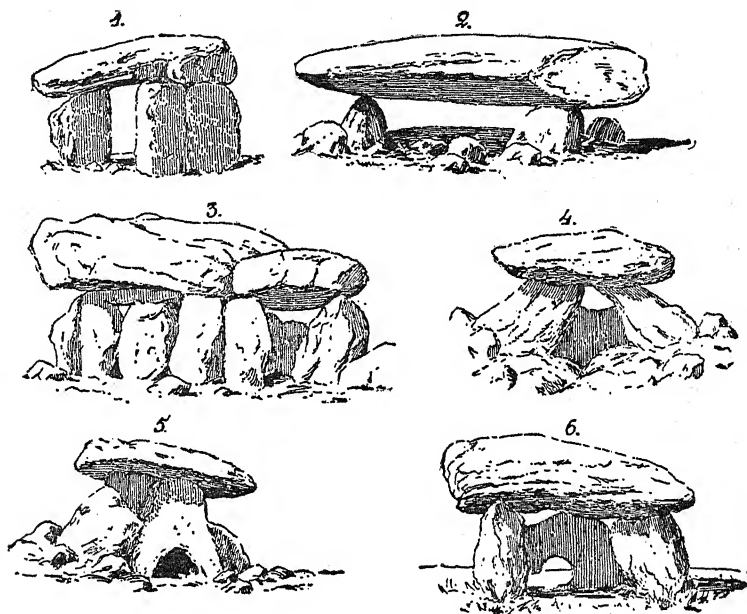


FIG. 145. Dolmens: 1, Brantôme (Dordogne); 2, Table des Marchands (Locmariaquer, Morbihan); 3, Krukenn (Plouharnel, Morbihan); 4, Lauzo (Orgnac, Ardèche); 5, Gramont (near Lodève, Hérault); 6, Trie-Château (Oise).

giving the alley a triangular section. Quite a number of these monuments are known that consist only of a long gallery without any definite chamber (Fig. 146, Nos. 2 and 6). In some countries, Ireland among others, the covering stones are replaced by corbelled vaults, constructed of small flat stones (Fig. 146, No. 7). In France dolmens are often floored with slabs of stone (Fig. 148, Nos. 1 and 6).

In many cases dolmens are covered over with mounds of earth of smaller or larger size, but we cannot say for certain, that every dolmen was covered by a tumulus, nor that those

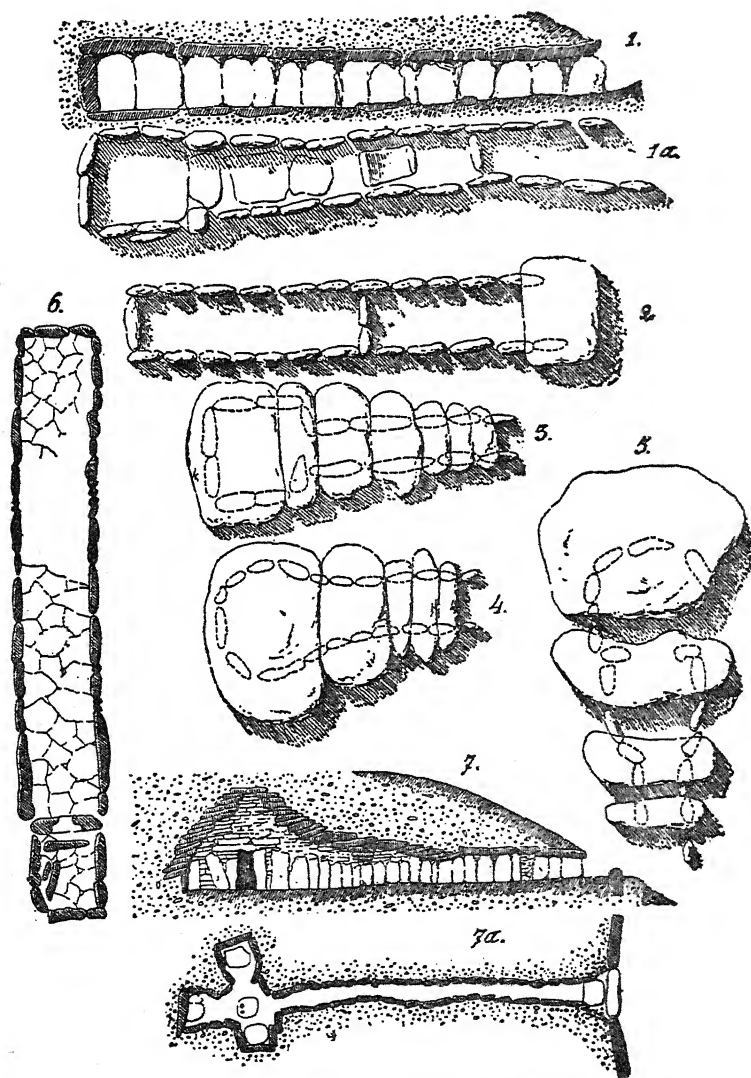


FIG. 146. Dolmens in plan and section.

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that are now uncovered were denuded of their mounds by cultivation or rain. In dolmens complete with tumulus, we observe about the circumference of the mound, a circle of large stones intended to circumscribe it. These circles of isolated stones are often seen without a dolmen in the centre. The greater number of such circles are merely the ruins of ancient mounds, but we must not confound them with

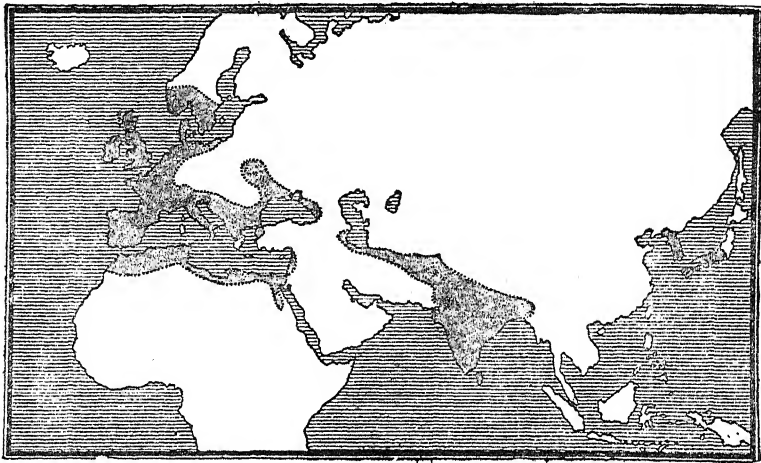


FIG. 147. Geographical distribution of dolmens in the Old World.

cromlechs,¹ monuments of unknown purpose, whose dimensions are much greater.

The appearance of dolmens² in Western Europe seems to coincide with the second phase of the neolithic industry of France and Switzerland, but this appearance is apparently illusory, since the most ancient among them, whose funerary furniture consists only of stone implements made of hard, imported rocks, contain traces of metal—copper and gold. Others are clearly eneolithic.

The geographical distribution of dolmens is very wide, (Fig. 147). We find them from the south of Scandinavia to Algeria, and from Portugal to India and Japan.³ In the north of Western Asia (Russian and Persian Talish) they all belong to the local copper and bronze age. It follows

¹ From *crom*=circle and *lec'h*=stone (in Breton).

² Cf. A. de Mortillet, **VIII**, XI.

³ Cf. **XXXVII**, 153, and notes 2, 3 and 4.

that if the practice of constructing such edifices came into our part of the world from Asia there would have come with it the knowledge of metals, and this seems to have been the case, since although in Western Europe these tombs contain funerary furniture of neolithic appearance, this is certainly due to the scarcity of copper among their constructors. The hypothesis that dolmen building spread in

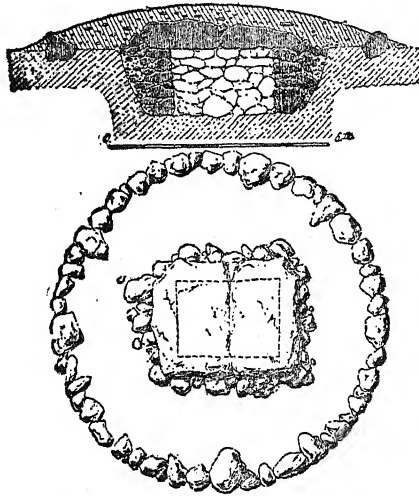


FIG. 148. Built dolmen, Namin, Ardebil province (Persia)
(Author's Researches).

the opposite direction is untenable, for it would postulate an inception of the metal industry in Caspian countries posterior to its beginnings in Armorica, which is an impossibility because Asiatic civilization goes back much farther than that of the West.

It remains for us to suppose that the idea of constructing these huge tombs was born at different dates in different countries, since the cult of the dead is far too ancient and widely distributed for us to explain its general acceptance by propagation from any one centre. Apparently the solution of the problem must come from a combination of hypotheses, for it is impossible to connect the monuments of Japan, Madagascar, and South America with the great group of Asiatic-European dolmens.

In all countries the earliest dolmens are built of large unhewn blocks of stone. Then the blocks used for the vertical walls gradually diminish in size, until the earlier lateral blocks are replaced by a built-up wall of undressed stones, it is true, but carefully laid. The great roof-slabs alone persist (Fig. 148),¹ and, as the monument becomes smaller in size, the cist is finally arrived at.

This is not to say that the practice of burying the dead in stone cists is posterior to the dolmens. The two methods of sepulture were certainly in use at the same time in the same countries—but the principle of these funerary constructions is the same. Further, the conception of the dolmen with its tumulus, interpreted by peoples of advanced culture, produced in certain districts veritable colossi—witness the royal pyramids of the Ancient and Middle Egyptian Empires.

The dolmens are not the only megalithic monuments of prehistoric antiquity. In many districts we also find traces of religious or superstitious beliefs as yet unexplained connected, perhaps, with the cult of the dead, and manifesting themselves in the form of standing stones (menhirs)² (Fig. 149); trilithons—somewhat rare, and composed of two uprights and a lintel; and finally of alignments of monoliths (Fig. 150), usually associated with cromlechs. The dolmens themselves sometimes present inexplicable peculiarities. Some are divided into several chambers communicating with each other by a circular hole pierced through the partition (Fig. 145, Nos. 5 and 6; Fig. 146, No. 6).

In France menhirs are even more numerous than dolmens. A. de Mortillet counted 6192 of them, including alignments and cromlechs;³ their distribution, however, does not altogether coincide with that of dolmens. The greatest of these monuments is the Men-er-Hroëck (Pierre de la Fée), now fallen and broken, which measured 20.50 metres in length. This monolith recalls the obelisks of Egypt in its dimensions; that of Hatasu at Karnak, however, is much larger, its height being 33.20 metres. We soon become lost in conjectures as to the primitive purpose of these monu-

¹ **XXXVI**, IV, 1st part, 13 ff.; **XXXV**, VIII (1905), 251 ff.

² *Men*=stone, and *hir*=long (in Breton).

³ A. de Mortillet, *Distribution des mégalithes en France*, VIII (1901), 40.

ments, but up to the present time none of the proposed hypotheses have rested on scientific bases.

The same holds true for the alignments, long parallel lines of menhirs planted in the earth at almost equal intervals, a remnant of which still may be seen in the departments of Morbihan and Finistère. Formerly the alignments stretched much further, but, even what remains of them is still very impressive.

Cromlechs are large circles of 50 or 60 metres in diameter

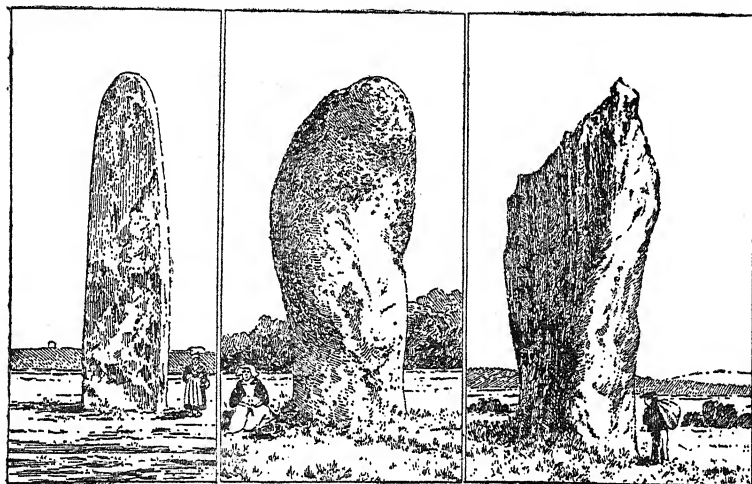


FIG. 149. 1, Menhir of Kéroutzel at Porspoder (Finistère); 2, Géant de Kerdif, Carnac (Morbihan); 3, Penmarch (Finistère), 7 metres high.

formed of menhirs. These megalithic monuments are widely distributed in France, the British Isles, Sweden and Denmark. We meet with a few in Western Asia. So far the interpretations given all belong to the realm of phantasy.

The number of Quaternary burials hitherto discovered is too small to furnish us with much information as to the rules then governing inhumation, and there are no indications for that epoch to throw light on the practice of incineration, which was frequently resorted to by the neolithic population of Europe. With the appearance, however, of polished stone, there is much more to guide us. In certain districts, such as Scandinavia, the neolithic burials were all

by inhumation, whereas in France, and especially in Brittany, the dead were frequently burned.¹ In the departments of the Marne, the Aisne, and the Gard, and in many other parts of France incineration was also the rule.² This custom of destroying the body by fire was also in force in the same period in Thuringia and in Western Prussia,³ whereas in



FIG. 150. Alignments of Menec at Carnac (Morbihan).

the British Isles, in Italy, and in Switzerland no traces of incineration in the corresponding epoch have yet been found.

In historic times, moreover, both cremation and inhumation were practised by Latins and Etruscans. It was only in the East, and especially in Egypt, that the destruction of the body would appear to have been avoided. Nevertheless, the burning of the primitive royal tombs of Nakadah and Abydos suggests that in the earliest times incineration was practised in the case of important personages, and not only incineration of their bodies but of everything that had belonged to them.

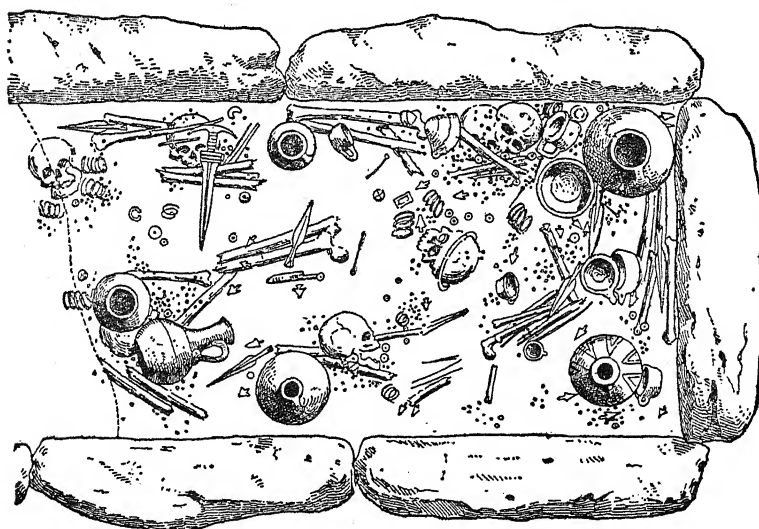
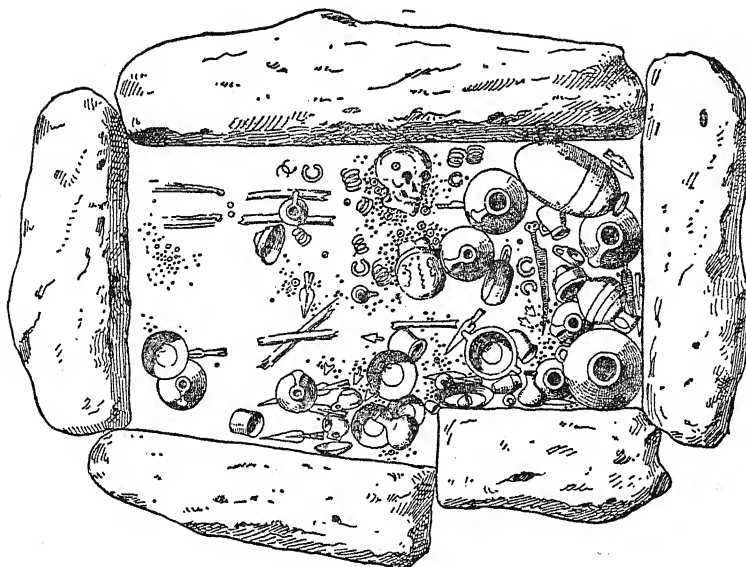
Judging by the colour on the bones, it would seem that ante-sepultural exhumation had been practised from Quaternary times.⁴ For more recent periods there are numerous traces of the custom in Western and Central Europe, in Russia, and, it would seem, even in Northern Caucasia.

¹ **XLV**, 17.

² Cf. **XXIV**, 270.

³ Olshausen, *Leicherverbrennung*, **XX** (1892), 163.

⁴ Piette, **VI** (1896), 386.



FIGS. 151 and 152. Iron Industry Burials, Djonu (Russian Talish).
The author's excavations.

During the course of the bronze industry, in our part of the world, the ancient customs of neolithic times persisted. Dolmens, however, gradually ceased to be built, those that remained being often used as ossuaries. Thenceforward, burials were effected in cists, in graves with walls of rough-hewn stone, and in chambers (Figs. 151 and 152) over which a tumulus was raised, sometimes attaining considerable proportions. That of Saint-Menoux (Allier) measured no less than 25 metres in diameter;¹ it contained four skeletons.

At this epoch, cremation was also practised in Europe, but, as in earlier times, Asia did not adopt it, or at least we have not yet encountered any trace of it in the Orient. There, in certain districts, such as the north-west of Persia, the various transition phases from the large dolmen to the cist can be followed, while the funerary furniture is seen to improve in proportion as the architecture of the tombs becomes elaborated.

If the primitive inhabitants of the mountains bordering the Caspian on the south-west did not actually burn the dead, together with their wives, as was done in India, it would seem that a man at least took them with him into the other world. A burial that I had the good fortune to discover at Veri (Russian Talish) in 1890, is explicit in this regard.

A cist of irregular contour (Fig. 153) contained four bodies.² At the right were the man's remains (No. 1) accompanied by his arms—a long and slender sword, four daggers, several lance-heads, and a considerable number of arrow-heads. His personal ornaments consisted of a torque, some beads and small golden discs. To the left of the man, in the middle of the tomb, were two women's skulls (Nos. 2 and 3) surrounded by beads and gold discs; each skull had its torque and bracelets, but no weapons. To the left is another female skull (No. 4), surrounded by the same ornaments, and, not far away, a metal mirror. (In Fig. 153 the vases have been taken out, in order that the position of the objects and of the skeletons may be better appreciated).

An examination of the grave goods shows very clearly that the three women had accompanied their master into the tomb. The position of the ornaments, the orderly

¹ LIII.

² All the objects found in this tomb are at the Musée de Saint-Germain.

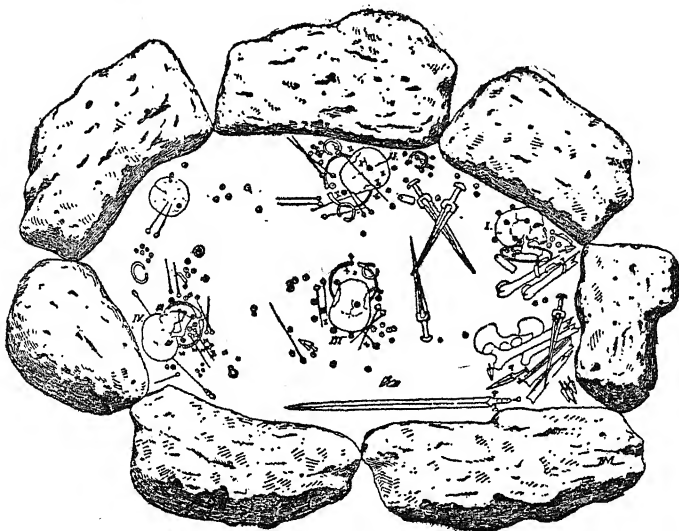


FIG. 153. Bronze industry burial, Veri (Russian Talish); the author's excavations. (The vases have been taken out).

manner in which they are distributed, and the fact that not a vase was broken, proves that these women had been put to death before the closing of the sepulchral chamber. Here the ascertained data comes to an end, but they are important in regard to the funeral ceremonies of the bronze period in this district, for they open the way to comparisons with India, where the same rite of sacrificing the women has existed in another form from very remote times. This tomb recalls those of the Scythians of which Herodotus tells us.

The manners of those days were highly diverse and were often horribly barbaric. Thus Stölpe, a Swedish authority, who studied a cave on the island of Stora Karlsö (Gothland), has established the fact that the inhabitants of that island in neolithic times were cannibals,¹ and we also find mention of cannibalism in Europe in historic times.²

The neolithic people indulged in still other practices on the bodies of the dead, and these customs have left their traces. They cut circular portions from the skulls—trepanned them, not with any surgical end in view as in this operation

¹ *LII*, 20.

² *Id.*, p. 20, and for Switzerland, *LXVIII*, 150.

to-day, but in order to obtain fetishes, for these circular pieces were pierced with holes that they might be suspended or worn as part of a necklace; the Gauls also indulged in this practice.¹ In the oppidum of Stradonitz in Bohemia a fragment of a brain case, decorated with engraved geometric designs, has been discovered; this is evidence of a custom that exists to this day in Oceania.

Thus, as we see, funeral customs in prehistoric times were extremely varied; we possess but scant information on most of them, and many escape us completely.

In Persia, Mazdaism put an end to earth burial, and in the north of Iran coffins for the exposure of the bodies succeeded the graves of the iron industry period.² It is only with the coming of Islam, that is to say, in the seventh century of our era, that graves reappear. As it is now generally agreed to place the appearance of the Zoroastrian doctrine in Media in the fifteenth century before our era, this would then be the date, within a few centuries, of the disappearance of the sepultures of the iron industry in that country—if, indeed, the men of the iron industry, whose sepultures have been found, ever were converted to Mazdaism.

The cult of the dead was not, of course, the only religious belief of prehistoric times. There were a multitude of others, but this question of the philosophical ideas of prehistoric peoples is most obscure, because we have practically no such evidence as would support even a hypothesis. Except for the funeral rites which, as we have just seen, show that in all countries man was preoccupied about a future life, we are nearly always constrained to turn to historical sources, and to go back, in thought, across the ages, with the feeble assistance of such rare prehistoric objects as seem to lend themselves to an interpretation, ere we can have any idea as to what these primitive cults consisted in. Such an excursion into the historic origin of beliefs reveals to us religions that are infinitely varied, which still further complicates the task of the prehistorian. In truth, if we have evidence that at the beginning of the historic era the peoples of even a single region possessed a variety of beliefs, what are we to think

¹ Cf. G. de Mortillet, *Trépanation préhistorique*, I. (1882) 144.

² Cf. *Rech. archéol.* (1896), 13-125; XXXVI, IV.

of those that successively jostled each other in this same district in earlier times?

Religions are born, prosper, are sometimes very widely distributed, then become decadent and die. Only those based on genuinely philosophic principles survive. But the further we go back in time and the further we get away from higher conceptions, the more deeply we penetrate into the practices of superstition and magic, because the human being, faced with the impotence of his efforts against incomprehensible phenomena, and being guided on the one hand by fear, and on the other by hope, necessarily attributed most of what he saw and all such experiences as passed beyond the bounds of his intelligence, to a host of different causes. Thus an infinite variety of practices grew up: "Man at first populated space with free, sentient forces, susceptible to prayer and pity."¹ The idea of the one God came only much later, since it demanded a generalization of causes that a highly-evolved mind alone was able to conceive.

The domain of the incomprehensible, at first of vast extent, became gradually limited in proportion to intellectual progress. The primitive divine pleiad, born of the multiplicity of phenomena, was provided with a master, and in a few rare and refined souls was born the conception of a force superior to and containing all other forces. The concept of a unique deity was now formed, but in many religions this higher conception remained a secret of the priesthood. Such was the case in Egypt, and probably also in Chaldea; and it is very probable that the Hebrews got their idea of Jahveh from these sacerdotal ideas. But in no oriental religion were the ancient gods entirely sequestered from office; the priests retained them for a long time to come, because the people were not sufficiently advanced to be made to renounce their superstitions.

Among all the peoples whose religious origins we have been able to study, or where, at least, we have been able to go far back in the examination of their beliefs, we meet with polytheism. Egyptians, Chaldeans, Elamites and Hellenes all possessed an elaborate pantheon. The same is true of those races which, by our geographical discoveries of

¹ Renan, *Hist. du Peuple d'Israël*, I, 27.

the seventeenth and eighteenth centuries, we were able to surprise in the actual possession of their prehistoric civilization.

Among the Semites of Chaldea, the Akkadians, we find from the beginning that the idea of divinity is connected with the stars, whereas for the Sumerians, the ancient inhabitants of Mesopotamia, the incomprehensible power belonged to the forces of nature—conceptions, which, though differing in form, sprang from the same spiritual need to address oneself to someone or something by which to conjure ill-fortune.

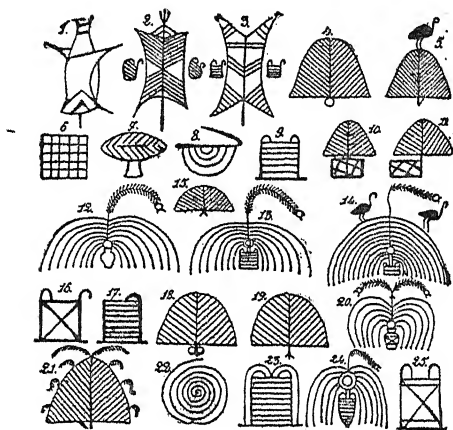


FIG 154. Religious emblems and tribal crests on Egyptian pre-dynastic painted vases. 1-13, Nakadah and Ballas; 14, El Amrah and Abydos; (15-21, after Schweinfurth).

These two primitive religions had nothing philosophic about them. Self-interest was their motive power, and superstition their guide.

In Egypt it would appear that there were two cults, that of the Libyan stone chipping aborigines, and that of the invaders who brought with them the knowledge of copper. Out of this mixed cult was evolved the pharaonic religion. The old customs survived, however, to Greek and Roman times. Everything in nature had formerly been deified, and each nome retained its god up till the early centuries of our own era. This was a survival some four or five thousand years old dating from the division of the country between those tribes whose distinctive badge or crest we noticed on the painted prehistoric vases. In Egypt, as in Chaldea, every

divinity had its emblem, its animal, or its privileged object, and this primitive cult of animals, the last trace of the early totemism, was preserved by the pharaonic people. Cats, dogs, jackals, crocodiles, and oxen were mummified, as though they themselves had been the divinity.

But Asiatics, both Semites and those of the ancient races, also venerated nature—trees, springs, rivers, and mountains—and this cult would seem to have been the oldest among



FIG. 155. Impression of a seal (Palace of Knossos). Goddess appearing on a mountain top between two mastiffs, and a worshipper.

every people. We meet with it in Western Europe and among uncivilized peoples to-day, and more extended research cannot fail to bring us proof that in every land it was the basis from which all other cults were elaborated.

In the study of prehistoric religion we must thus reject any idea of a unique divinity and recognize that naturism, whether it concerns the astral bodies or confines itself to terrestrial phenomena, is at the root of all early religion. The sun, moon, stars, thunder, tempests, rain, wind, heat and cold have everywhere at some time been considered divine. So also have springs, lakes, rivers, mountains (Fig. 155) rocks, and trees, and the beasts of the field and birds of the air. These cults have varied greatly, however, according to place and time. We must content ourselves with gleaning from this infinite variety a few about which definite testimony has come down to us.

First of all we will contrast with the cult of the dead and the conception of terrestrial annihilation, the cult of life, creation, fertility, abundance and good fortune personified by the Chaldean goddess Nana, only another form of the Astarte of the Hellenes.

Right down to those deeper deposits of Chaldean and Susian ruins in which the painted vases of eneolithic industry are at last reached, we find crude figurines of this goddess (Fig. 156, No. 1), and also of her symbol (Fig. 156, No. 2) in a form which in later historic times is constantly in evidence as a votive offering in clay (Fig. 156, No. 3). In Egypt, we again find either the actual image (No. 4) symbolizing fertility, or symbolized (No. 5) in a

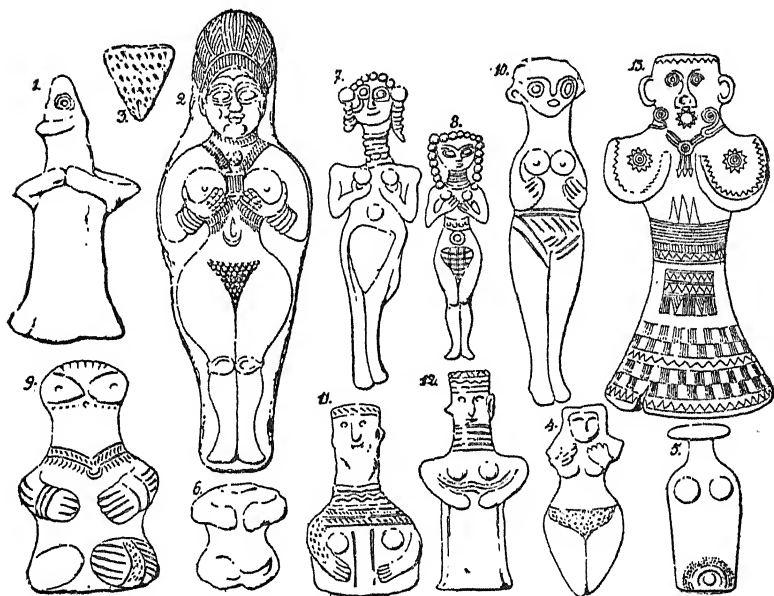


FIG. 156. Representations of the goddess Nana (Astarte).

purely Egyptian fashion, for it never appears in Chaldea under this form. It disappeared from the valley of the Nile from the time of the establishment of pharaonic civilization. It did not, however, emigrate from Mesopotamia to Egypt alone, for it is also found at Hissarlik, in the ruins of the second city (No. 7); in Cilicia, at Adalia (No. 9); in the Ægean Islands at Cyprus (Nos. 6, 10, 11, 12) associated with objects of neolithic industry, and even at Kličevac in the Danube basin not far from Belgrade (No. 13). The entire East and some European countries worshipped the Mother goddess, the giver of fertility to the fields, and to man and beast.

The gods had representations made of them and temples and altars raised to them, both in Asia and Egypt, whereas in the west and north of Europe such images were apparently forbidden by the laws governing religious cults. At all events we have no evidences of religious sculpture in neolithic times or the period in which the bronze industry flourished. A single rock painting from Spain (Fig. 157), which, in my view, has mistakenly been approximated to Magdalenian art, shows us for the neolithic, or some later period a ceremony of sorts, perhaps a dance by women which would appear



FIG. 157. Ritual dance, Rock painting from Cogul (Spain).
After H. Breuil.

to have some connection with the cult of Priapus. These women are depicted as wearing long skirts and strange head-dresses, with breasts bared; their costume reminds us of Cretan representations of a ritual dance (Fig. 158). These paintings, however, are situated in Spain, a country which,

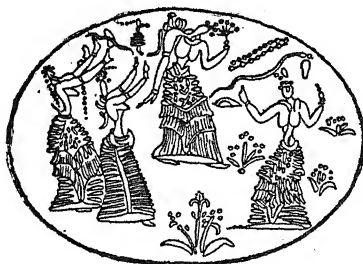


FIG. 158. Gold Ring from Isopata (near Knossos). Ritual dance.

according to H. Breuil, had not been subjected to Ægean influences. We must therefore consider this to be either a purely native scene, or else of African origin.

The solar cult, very ancient in Chaldea and Egypt, shows itself, in Europe, from the time of the bronze industry, but the objects bearing witness to its existence in France accord so nearly with the Greek myth that we are led to believe that the ritual implements were inspired by the Hellenic world.

We know that according to the ancient myth the sun made his daily journey across the heavens in a chariot drawn by horses (Fig. 159, No. 2), and that when he had to return from the place of his setting to the place of his rising, the god left his chariot (Nos. 1, 2 and 10, solar disc and chariot), and was conveyed in a boat on the river Ocean (Nos. 3-7, solar ships).

At Trundholm in Scandinavia, a bronze ritual chariot has been found, drawn by a horse and carrying the disc; and in both Ireland and England several solar discs in gold have been discovered (Fig. 159, Nos. 8 and 9, the swan). These same northern countries furnish examples of rock gravings (in Scandinavia), of knife blades with graven representations of the solar ship, and finally of a votive bark in gold (Jutland). Thus the myth was fully developed in Scandinavian countries. Montelius considers that the Trundholm chariot belongs to the second Scandinavian bronze phase, which he places about the year 1300 B.C., and at that period the Hellenic peninsula had long had commercial relations with the Baltic countries, thanks to the trade in amber.

But if the Horse was associated with the daily solar journey, it was the Swan that drew the divine bark on the return voyage, and even if no representation of the Swan thus harnessed to the divine ship has yet been found, at least the Swan itself figures constantly as a decorative motive in France, the north of Italy, Central Europe, and the Scandinavian countries themselves, from the time of the local bronze industries right up to iron age times just prior to the historic period. So much so that, according to the most competent prehistorians, the solar cult must have been in honour throughout Europe for fifteen hundred years at least. It extended throughout the Hellenic peninsula, Egypt, Chaldea and Arabia, and was thus distributed all over the ancient world. Further east still, in Media, it took a peculiar—but not, as has been claimed, an exclusive—form, since the doctrine of Zoroaster admitted of secondary divinities,

and centuries later, although they were fervent Mazdeans, the Sassanid kings described themselves in their protocol as *minutchetri men yezdân*, that is to say, as the "issue of the gods."

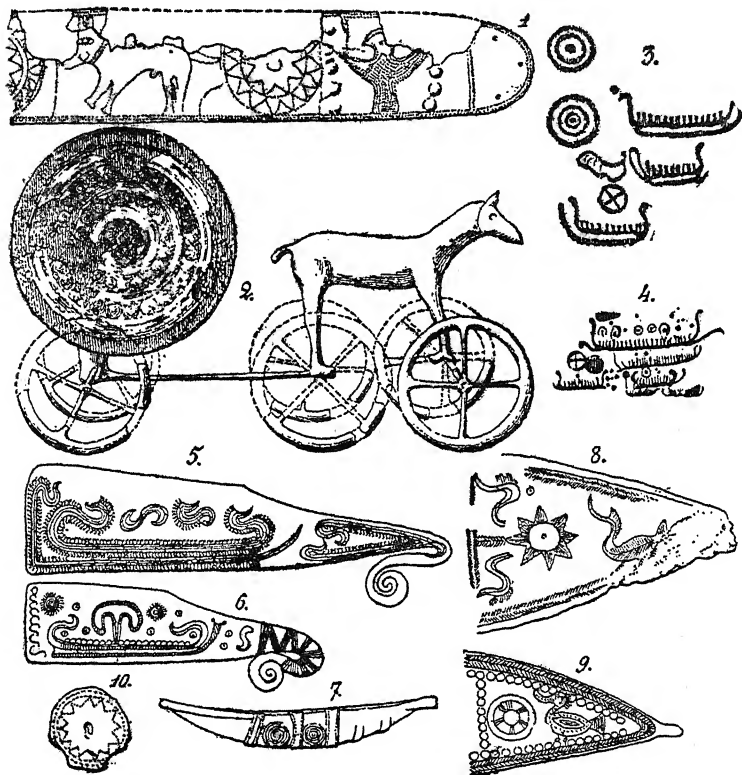


FIG. 159. The Solar Attributes: 1, Silver band from Syros (Ægean civ.); 2, Solar chariot from Trundholm (Sweden); 3 and 4, Solar boats, graffiti in Sweden; 5 and 6, Scandinavian knives bearing solar boat; 7, Votive boat of gold from Nors (Jutland); 8, Bronze belt from Falerii (Italy); 9, *id.* from Poggio Burtone (Italy); 10, Disc from Staadorf (Upper Palatinate).

The solar cult in Persia, however, was certainly much older than Zoroaster, for the disc, the swastika and other symbols recognized to-day to be merely conventionalizations of the sun have been met with in the earliest burials. The swastika appears on the earliest Indian money—stamped ingots attributed to the seventh century B.C.

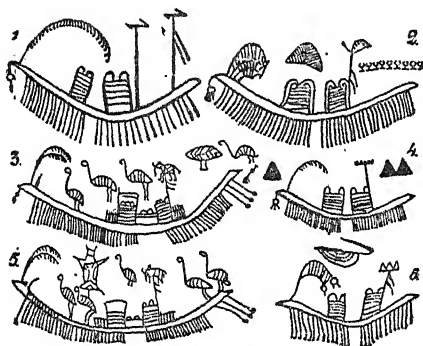


FIG. 160. Funerary barks painted on Egyptian pre-dynastic vases.

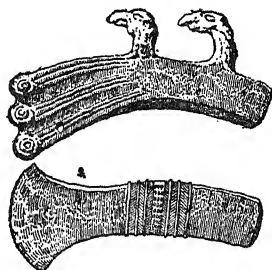


FIG. 161. 1, Votive axe-head in bronze (Susa); 2, Votive axe-head in stone (Hissarlik).

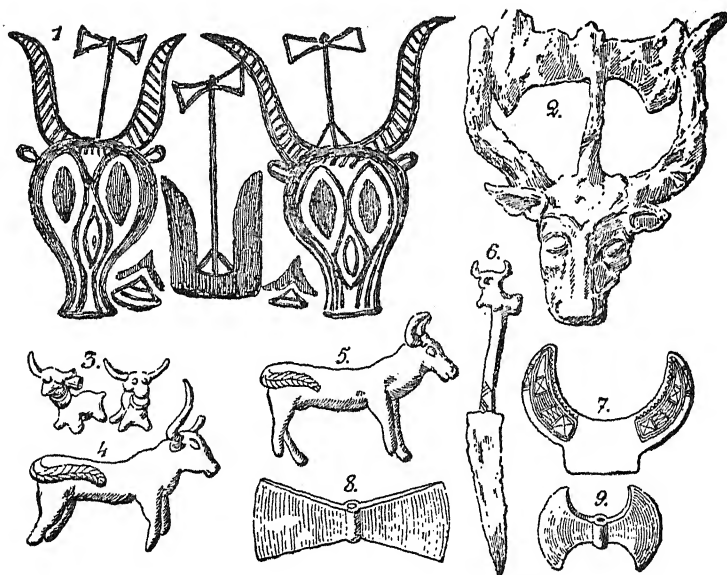


FIG. 162. Votive axes and bulls. 1, Mycenæan vase, Cyprus; 2, Hissarlik; 3, Bithin (Posen); 4, 5, Chatillon-sur-Seiche (Ille-et-Vilaine); 6, Hissarlik; 7, Ebersberg; 8, Olympus; 9, Cave of Dicté (Crete).

Ships (Fig. 160) figure frequently on the painted funerary vases of primitive Egypt; but these representations must not be confounded with the barks symbolizing the sun's nocturnal journey, for these ships would seem to be the first witness to the pharaonic custom of transporting the dead to his last abiding-place by river. This custom was still in force up to the twelfth dynasty, and funerary ships, as my excavations at Dahshūr have shown, are unquestionable proof of it. Furthermore, the Egyptian bas-reliefs of every period bear witness to this rite.

We must again draw attention to the ritual importance attached both in the Orient and in our own land to the single or double-headed votive axe (Fig. 162), and the bull, whose image is rendered in full or represented quite often by its horns alone. These two symbols are often combined, hence they must have figured, if not the same idea, at least beliefs that were very closely related.

Thus, in a number of instances, primitive naturism gradually became transformed, and the early notion of gods under their actual form gave place to emblems symbolizing them. For example, we see the god or his symbol figuring indifferently on the Chaldean *koudourrous* (boundary stones). It was thus that the Egyptian, Greek and Italiote pantheons likewise originated.

Such, in general outline is the sum of our knowledge regarding men's religious beliefs in the days before History. Magic and divination, developing out of naturism, played a great part in the rites of those days, but we are quite ignorant of the details of such practices; the evidence is still to seek.

CHAPTER III

THE WRITTEN WORD

WHEN men got beyond the purely material stage, and their minds were stimulated to reflection, they began to experience a need to place their thoughts on record that they might be conveyed to others by signs intelligible to all. The first means they found by which to do this was to represent in drawing the simple ideas conceived, and from this first essay pictographic representation was born. But as the limits of detailed pictography were soon felt to be too narrow to respond even to the simplest abstract ideas, conventional pictographs were evolved whose outlines rapidly took a hieroglyphic form. Thanks to Man's intellectual development, and to the progress that he daily achieved in all branches of thought, his needs soon outstripped even this writing, because certain spoken words could not be expressed by the figures at his disposal, and he was unable to create for them any means of graphic expression. It was thus that, neglecting the representative signification of certain signs, he accorded to them a phonetic value instead, just as we do with a rebus to-day. Hence arose hieroglyphic writing properly so called—that is to say, the hieroglyphs of Egypt, primitive Chaldea, the Hittites, Crete, China, Mexico, etc., composed as they are either of representative, ideographic, or phonetic signs, all used side by side. From these was evolved, by successive transformations of the phonetic signs, syllabic writing such as Chinese and the cuneiform of the Achæmenidæ; and it was from these systems again that the alphabetic conception derived.

Such was the rational evolution of writing. Only certain peoples passed through all these successive phases. Side by side with writing there also grew up among many tribes a purely conventional mnemonism, but since it was conventional, the key to it disappeared together with the men who made use of such methods.

In Quaternary times, graving and painting in many cases probably served for simple pictographic writing, though we cannot be sure of it. But alongside of these possibly ideographic artistic representations, there were also a variety of memory-aids, of which traces are frequently found. The

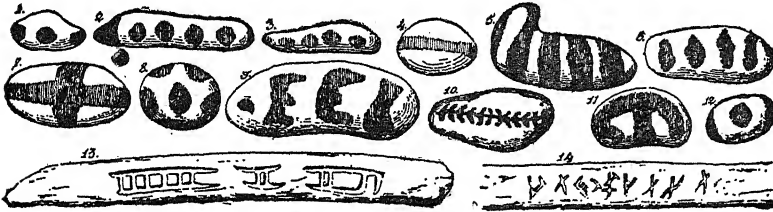


FIG. 163. 1 to 12, painted pebbles from the Mas d'Azil (Azilian); 13 and 14, engraved bones, Lorthet cavern (Hautes-Pyrénées) (Magdalenian).

painted pebbles of the Mas d'Azil (Fig. 163, Nos. 1-12), and the engraved bones of Roche-Bertier (Charente), and Lorthet (Hautes-Pyrénées) (Fig. 163, Nos. 13 and 14) are undoubted examples.¹ Thus from the close of the Quaternary period the men of our regions used the same mnemonic means still employed by the uncivilized tribes of Oceania, and which were also used by the Indians of the New World. But the custom seems to have disappeared with the coming of mesolithic industry, or, at least, we see no further traces of it from the moment when the Campignian industry appeared, nor throughout the bronze phase of the west of Europe.

Hieroglyphics do not seem to have been known in our part of the world. This system was evolved in the Orient, in Central America, and in China. We find it established

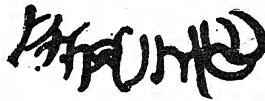


FIG. 164. Münsingen inscription (Switzerland) on a glass bead found in a disturbed tomb of the La Tène industry (epoch uncertain).

in Egypt from pre-pharaonic times; it must have come into the country together with the knowledge of copper. In Chaldea and Elam it already existed in eneolithic times as

¹ Piette, *Étude d'ethnographie préhistorique*, VI (1896), 385.

a precursor of cuneiform signs. We see it completely developed among the Hittites at the epoch of the Rames-sides, but we know nothing of its beginnings. The same is true for the Ægean hieroglyphs.¹ These systems of

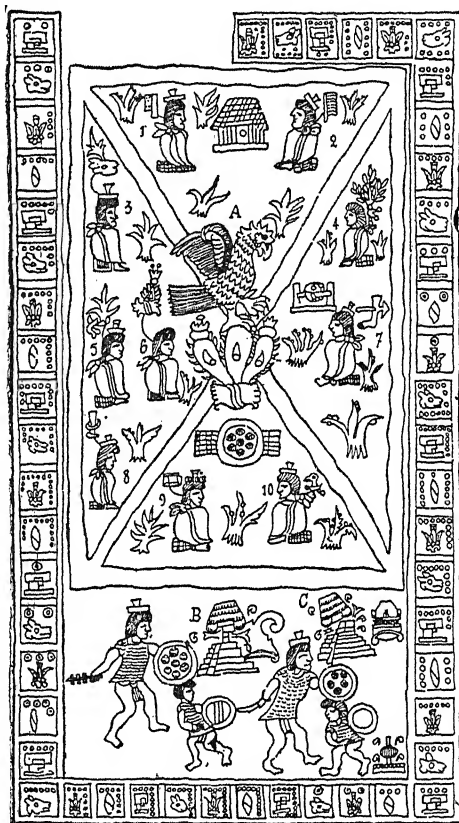


FIG. 165. Figurative Mexican painting with descriptive legend in hieroglyphics (after L. de Rosny).

writing, in which phonetization undoubtedly plays a great part, did not extend beyond the countries in which they corresponded to the local idiom. Even when communication between Orient and Occident became easy, they were never adopted in Europe, and did not even inspire analogous systems. No alphabetical system was known in the Occident before the appearance of Hellenic writing. As an example

¹ Cf. **XXVII**, 424 ff.

of the sole attempt independent of Greece, so far discovered, we may instance the inscription of Münsingen in Switzerland



FIG. 166. Chinese characters of different epochs.

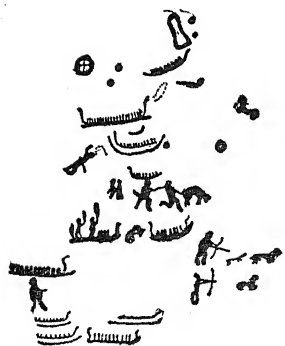


FIG. 167. Pictographic representation on rock at Skebbervall (Bohusland, Sweden).

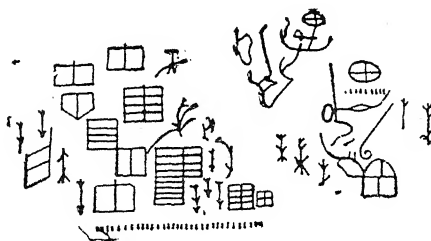


FIG. 168. Pictographic representations on the rocks of the river Irtysh (after Spassky).

(Fig. 164), on a glass bead dating from the beginning of the iron industry. We know nothing of its origin.

Among essays at figurative inscriptions which remain without sequel we may mention those on the Bohusland rocks

in Sweden (Fig. 167), those in Siberia (Fig. 168), Upper Egypt (Fig. 169), and Mané-Lud at Locmariaquer (Morbihan) (Fig. 170), as among the more characteristic of this kind of idea-record.

There are several hieroglyphic systems which have had a long career and whose transformations have led to much more complete systems of writing. The most important are



FIG. 169. Graffiti scratched on the rocks of Jebel Hetemat (Upper Egypt) (discovered and drawn by G. Legrain).

those of Chaldea, Elam, Egypt, China, and Mexico; we can easily follow the stages of their progress.

In the Chaldeo-Elamite countries we find ourselves, from the very earliest times, in the presence of two parallel systems—the native system of Elam, and the Chaldean which would appear rather to be of Semitic origin, and which finally dominated the whole district.

A very ancient cylinder-seal discovered at Susa (Fig. 171) bears a clearly hieroglyphic text, and the clay tablets inscribed with the most archaic texts of that country frequently bear the stamp of hieroglyphic cylinders (Fig. 172).

The proto-Elamite writing (Fig. 173) seen on these numerous tablets is transitional between representative or else ideographic hieroglyphic characters, and the purely conventional signs. This writing was used not only on clay but on stone (Fig. 173), and preserved the same aspect in both cases.

In the Chaldeo-Elamite countries, soft clay was the usual medium for writing, but as clay did not lend itself to the drawing of curved forms, the writer, except where he could stamp circles and ellipses, was generally reduced to



FIG. 170. Figures outlined on one of the stones of the chamber, tumulus of Mané-Lud, Locmariaquer (Morbihan).



FIG. 171. Impression from a hieroglyphic cylinder found at Susa (*Mém. Délég. en Perse*, Vol. II, 1900, p. 129).

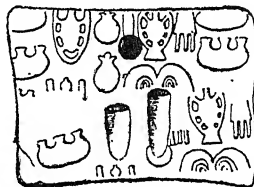


FIG. 172. Stamp of a cylinder, bearing a hieroglyphic inscription, on a proto-Elamite tablet (*id.* Vol. X).



FIG. 173. Proto-Elamite inscription on a clay tablet (*id.*, Vol. VI, pl. xxi).

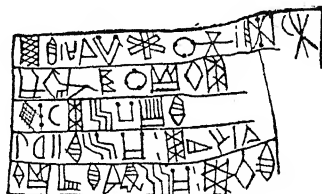


FIG. 174. Lapidary inscription in proto-Elamite characters of the Susan Patesi, Karibou-Sha-Shu-shinak. Vol. VI, pl. ii, 27th century B.C.

transforming the curves into more or less regular polygons when he had only the triangular point of his stylus to depend on.

In spite of the physical difficulties he had to overcome, the writer of those early days frequently retained, in his signs, the general form of the subjects he intended to represent, even while he translated them by irregular strokes. We give (Fig. 174) facsimiles of some of these signs; first,

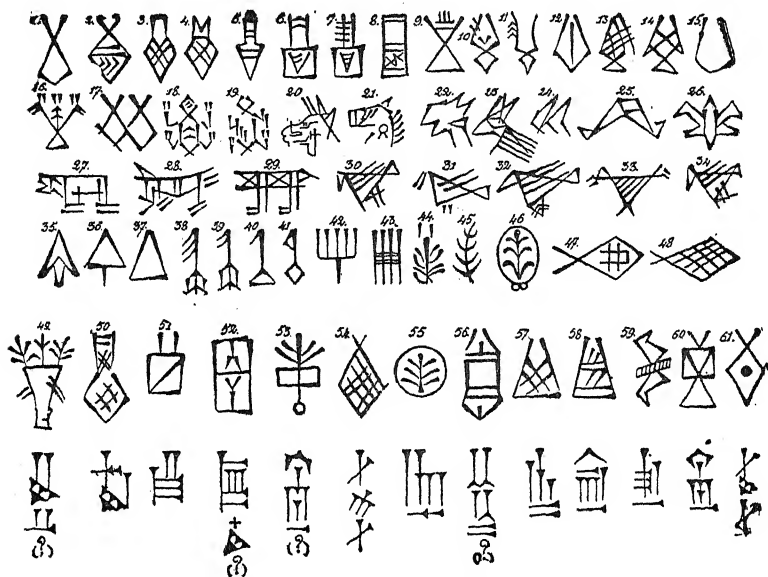


FIG. 175. Proto-Elamite writing.

those in which it is easiest to recognize the original shapes; and then (Fig. 175, Nos. 49-61) the late cuneiform equivalent of some of these groups. By studying this figure, the reader will be better able to grasp the evolutionary process that took place in Elam than by any detailed description. It should be noted that such hieroglyphs on clay could only be a copy of more complete signs, obviously foreign to Elam, for it was not by making their first essays on clay that the scribes had found themselves in a position to work out such representations.

One of the most interesting of signs in this regard, is that which represents a man (Fig. 176). The silhouette of

a more perfect and ancient model is preserved, but, except for the head, it is represented by simple cuneiform strokes.

The use of the proto-Elamite system, however, was to die out. We see the Chaldean linear cuneiform (Figs. 177 and 178) introduced into Elam at a very early date, and replacing the native writing.

This Chaldean writing also was hieroglyphic in origin (Fig. 179), but these hieroglyphs, when they made their appearance in Elam, differed from those of Susa since they

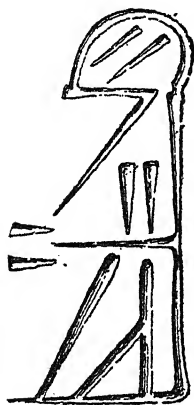


FIG. 176. Proto-Elamite writing: representation of Man



FIG. 177. Chaldean linear cuneiform (Yokha, Chaldea).

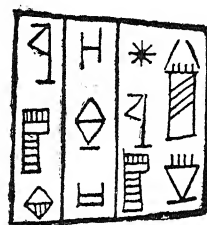


FIG. 178. Chaldean linear cuneiform (Susa).

started from different bases although following the same principles. It would seem certain that the Chaldean cuneiform was already much more advanced than the writing of the proto-Elamites. The two peoples aimed at analogous results, and the more advanced writing prevailed. In Egypt it was quite otherwise, because there clay was not the medium used for writing on, but the soft or hard stone so plentiful in the valley of the Nile.

In the earliest burials, however, and in those graves only, we find cylinders similar in every way to those of Susiana, and covered with representations and primitive hieroglyphs (Fig. 180). This type of seal is common in the tombs of the first dynasty, at Nakadah and Abydos. In these two localities we also find imprints of these cylinders on the large clay stoppers closing the big vases.

The Chaldeo-Elamite seal thus had its day in the valley of the Nile, but it did not long survive, for it was soon replaced by the real native seal, prototype of the scarab.

It was during the time that the cylinder was in use that hieroglyphs were definitively formed (Figs. 181 and 182), a process of writing which continued in use at least until the third century of our era. The materials which nature had

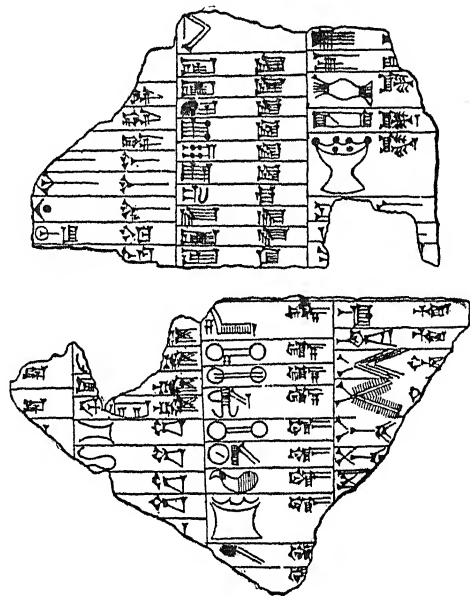
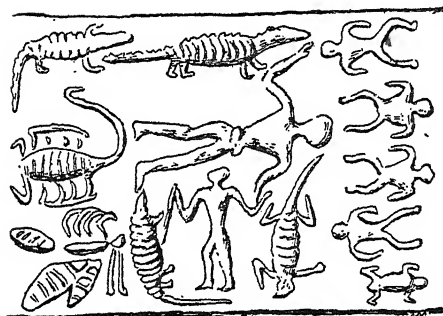


FIG. 179. Fragments of a tablet discovered at Nineveh, giving the explanation in cuneiform characters of the primitive hieroglyphs.

set to the hand of the scribes of Egypt and Chaldea were thus the means not only of preserving the hieroglyphic system in the valley of the Nile, but of forming the cuneiform in Asiatic regions.

It was not only in Egypt, however, that hieroglyphs were in vogue. They were also used by the Hittites (Fig. 183), in Crete (Fig. 184) from the time of the third Minoan period, in China, Transcaucasia, and Mexico.

Then, in certain districts systems of writing appeared that were derived from a simplification of the hieroglyphic signs, such as the Egyptian hieratic and demotic, and possibly the Cretan writing.



2.



3.



4.



FIG. 180. Pre-pharaonic cylinders (Egypt): 1, Soft limestone (Cairo Museum, No. 14518; Quibell, *Archaic objects*); 2, Kitchen midden of Adimiyeh: steatite (Cairo Museum); 3, Thebes: black stone (Cairo Museum); 4, Hierakopolis, steatite.

We know the Hittite hieroglyphs only from the rock inscriptions of Cappadocia, and we are ignorant both of their earlier development and of their origin. Opinions are divided about the hieroglyphs of Crete. Some consider them to be native to the island, while others—and we ourselves are among these—believe that they originated elsewhere. In China, the hieroglyph is the source of the signs still in use in the greater part of the Asiatic Orient. In Central America they survived up to the time of the

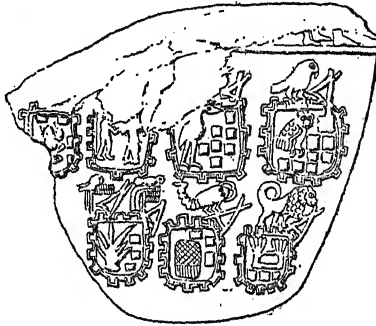


FIG. 181. Archaic Egyptian Hieroglyphs. Schist tablet.
(Cairo Museum).

Spanish Conquest. Other attempts do not seem to have left any traces in more recent systems of writing.

It is not our province to enter here into the origin and relationships of certain of these primitive systems. It is interesting, nevertheless, to note that the cradle of all writing is in Western Asia, and that it was thence that this knowledge was first carried to the Mediterranean by Phœnicians and Hellenes, while the peoples of Europe and Central Asia, Western Europe and East Asia were deprived of this great lever of progress. It was only much later, barely a few centuries before our era, that the use of writing spread slowly among the barbarian peoples. Etruscan, Iberian and Runic inscriptions appear only in centuries quite near the time of Christ, and sometimes not even until the first centuries of our era. This readily explains why, for several thousands of years, Chaldea, Assyria, Egypt, the coasts and islands of the Mediterranean and Western Asia remained undisputed mistresses of civilization.

When we consider humanity's efforts, as a whole, to record the spoken word, we see that this necessity has arisen in many places, and among many peoples at very different times.



FIG. 182. Ivory tablet from the royal treasure of Semti's tomb, representing King Ten, or Semti, dancing before Osiris (First Dynasty, about 4266 B.C.)

We also find that in most cases these attempts remained unfruitful, and that only in three centres did a more or less complete success crown these efforts. Finally, we see that Western Asia and Egypt alone succeeded in overcoming



FIG. 183. Hittite hieroglyphic inscription from Djerablus (after Wright, *The Empire*, pl. x).

every difficulty. It was from these two centres, thanks to writing, that the light of knowledge spread throughout the world.

Certainly, even in this limited area, every attempt did not meet with the same reward. Cretan, Hittite, and proto-Anzanite hieroglyphics disappeared without leaving any descendants. Cuneiform writing, after a long and useful career, became extinct in its turn. The Egyptian method

alone survived, not in the pharaonic form, but through others derived from it, whence, from the Phœnician characters, the ancestors of our present writing are believed to have been developed.

Certainly the five families of Oriental hieroglyphics, like the languages of the people who used them, are independent of one another. Can we admit, however, that, in a space so limited and among peoples dwelling so closely together, these varied attempts had no common origin? It is unbelievable. We cannot avoid seeing, in these very early periods, a common pictography, of which each people would have taken advantage, according to the needs of their particular language, and following their individual genius, quite independently of their neighbours.



FIG. 184. The Phaistos disc (Crete).

CHAPTER IV

INTER-RELATIONS OF PREHISTORIC PEOPLES

THERE can be no question of the commercial relations that existed in Europe from the days of the palæolithic industries; exchanges both as between different clans and different tribes certainly took place, but these transactions have left no trace. It is only with the appearance of neolithic industry that we have evidence, in the débris of daily life found on the sites of former habitations, of materials foreign to the locality and which must, therefore, have been imported. Thus the resinous-looking flint of Grand Pressigny is met with in prehistoric stations throughout the centre and east of France and even in Switzerland. Towards the close of the Archæolithic, both ocean and Mediterranean shells, used for ornament, become more and more frequent, in association, in the caves of Central France. These discoveries, however, are not conclusive in regard to the existence of actual trading, for in those days there was constant inter-tribal warfare, and the presence of these marine shells among populations living far from the coast might well be due to booty taken from the conquered enemy.

But it must have been otherwise with neolithic objects met with at great distances from the geological beds furnishing the material of which they were made, because we know of a number of manufacturing centres undoubtedly established with a view to the exportation of the implements there made.

Beyond doubt the trade in flints was considerable though the field for exportation was naturally limited to districts poor in stone that was capable of being satisfactorily worked. Other minerals were used as the raw material for personal ornaments, such as callaïs,¹ turquoise, and gold

¹ The callaïs of Pliny is a hard translucent mineral, often marbled with white, blue, or brown veins.

nuggets found among the grave goods of the dolmens,¹ and in some of the caverns in the west and centre of France, as also in Portugal. These minerals are not found in Central Europe nor in the pile-dwellings; but they certainly came from beds in our own part of the world whose location is no longer known to us, and they were the object of a limited trade in Western Europe.

Certain archæologists² consider that callais was brought

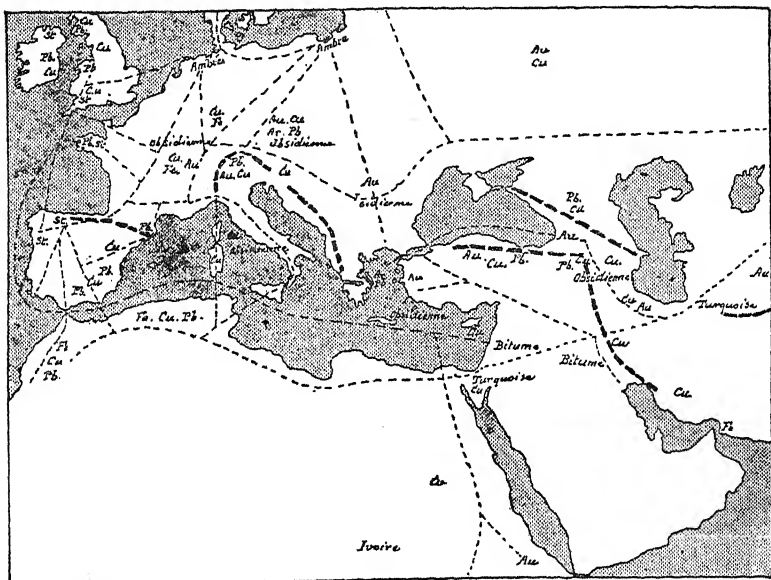


FIG. 185. Map of the trade routes of the Ancient World.
The heavy dotted lines indicate the natural obstacles such as mountains;
the lighter dotted lines the principal land and water-ways.
(Au=gold; cu=copper; pb=lead; ar=silver; st=tin; fe=iron.)

from the Orient, but this cannot be the case, because, if it had really been transported from distant lands, it would have been met with on the route of the caravans—which it is not. The same holds good for turquoise. Native gold, however, exists in quite a number of the rivers of France, Spain, Austria, Hungary and other countries, more especially, as regards France, in the basin of the Rhône. It is not surprising, therefore, to find it along with callais in the

¹ Cf. Déchelette, *Manuel*, I, 621.

² Cazalis de Foudouze among others.

dolmens of the south of France nor as far as Brittany,¹ and Portugal².

Amber was far more commercially important than the materials just mentioned. It does exist in France, and is collected on certain low hills in the Seine-Inférieure where it is associated with the diluvium pebbles, but the beds where it was found in abundance were on the Scandinavian and German coasts of the Baltic and North Sea. These were the deposits mentioned by classical writers, and the source alluded to by Herodotus, who, while he admits ignorance of Northern European geography, assures us that he has heard it said that amber came into Greece by way of the river Eridan (the Elbe, or the Vistula).

The earliest example of the use of amber in Western Europe is found in the cave of Auréan (Hautes-Pyrénées), contemporaneous with the Reindeer, but the amber of that period must have come from France itself.

During neolithic times amber was still rare in Gaul, but it was common in North Germany, Sweden, and Denmark, the countries of its production. This was because a market had not yet been established. With the appearance of bronze, it soon became the object of a considerable commerce, and was distributed throughout Europe and the Mediterranean countries. This traffic reached its culminating point in the iron age, and amber continued to be used long after the Roman occupation of Gaul, because there is not a Frankish necklet but has its yellow amber beads.

Amber seems to have been unknown in the southern parts of Western Asia, though it was used in Egypt from the twelfth dynasty. It should be noted, however, that the amber of the Egyptian tombs is more reddish in colour than Baltic amber, and did not therefore come from the Northern countries, but from some other undetermined source. Furthermore, during the times of the Amenemhats and the Usertesens, Europe was still sunk in barbarism. A certain number of peoples were just entering on the metal industry phase, and the Egyptians, who were very powerful in Africa, were

¹ Cf. Pitre de Lisle, "Notice sur les fouilles du tumulus de la Motte Sainte-Marie (Loire-Inférieure)," in the *Bull. archéol.* 1891, 38.

² Cf. E. Cartailhac, *Les Grottes artificielles sépulcrales du Portugal*, V (1885), 16.

pushing their expeditions far towards the South. It was from the Sudan, also, that they probably brought the amethyst beads of the necklaces of the twelfth dynasty princesses, stones of a deep wine-coloured violet, whose provenance is unknown and which are not met with in modern commerce. I have never found the slightest trace of a trade in amber in my excavations in Western Asia, either in the dolmens of the copper and bronze phases, the graves of the iron industry, or in the ruins of the city of Susa. Therefore, no relations existed between the Baltic countries and Western Asia. Nor is amber found in ancient times in Siberia or India. Thus is brought to nought not only those hypotheses attributing a European origin to peoples of Aryan speech, but any hypothesis postulating an eastward migration for western peoples. At least this holds good from the times when neolithic and eneolithic industry had become established in Western Europe. It also rules out Europe altogether as a birthplace of metallurgy. Further, what holds good for Baltic amber does so equally for callaïs.

There are still other materials whose presence in Western Europe has long been attributed to commerce. From the period of the Breton dolmens and the Swiss lake dwellings, precious materials appear in the form of axe-heads that are unknown for earlier prehistoric implements, such as nephrite, jadeite, chloromelanite, and saussurite.¹ The source of these minerals is not easily explained, and their origin has been the subject of much debate. For a long time opinion was at one that these precious rocks had been brought from the East—from Siberia and China. However, certain discoveries in Switzerland of strata bearing these minerals proves that they exist in Europe, and that it is therefore profitless to seek their provenance so far from home. It should be noted, moreover, that jade is not found in prehistoric times in any part of Western Asia, nor in the valley of the Nile, and that if this stone had come into Europe from the Orient it would have penetrated also into lands more advanced than ours where rare stones were greatly esteemed. Even in the flowering time of the historic

¹ Cf. A. Damour, **XIV**, LXI (1865). Meetings of the 21st and 28th of August.

period, when pharaonic lapidaries diligently sought for rare material, jade is never seen in their jewelry. Nor did the Persians make use of it.

Still another material played a great part in the polished stone civilizations and in the early days of metal: this was obsidian, or volcanic glass. It is met with in volcanic ranges as a molten substance in beds of pumiceous tufa. It may be dark green (Mexico, Columbia), blackish and almost opaque (Greek Archipelago), almost colourless, or simply smoked, and it is sometimes veined with opaque red streaks (Alaghiz, Russian Armenia). It is almost always translucent, and sometimes as transparent as window-glass.

The natural beds of Auvergne, Bohemia, Hungary, the Æolian Isles, and the neighbourhood of Naples appear to have been but little exploited, and used only for local needs; but the obsidian from the Isle of Melos, in the form of knife-blades, not unlike the flint knives of Grand Pressigny, but much smaller in size (the obsidian cores from Melos rarely reaching ten centimetres in length) formed the base of an important trade.

Thanks to the red veins so often present in the Alaghiz obsidian, we can follow its commercial exploitation right into Susiana. In fact, fragments and flakes of this rock are common in the oldest deposits of the tells of Elam, Pusht-i-Kuh, Luristan, the Bactrian province and all the western part of the Persian plateau. Even in the relatively recent period of iron weapons, very fine arrow-heads were made of it in the Little Caucasus and the Talish.

In the New World obsidian was made into beautiful implements not only in Mexico and Columbia, but also for export, and there does not exist an Indian encampment in the southern territories of the United States that does not contain arrow and lance heads in obsidian.

A large number of the Japanese neolithic implements are of obsidian, and there its use persisted long after the introduction of bronze. It should be noted that both in Europe and the Eastern Mediterranean, obsidian has apparently been in use only from the time of the eneolithic industries, when it is found with metal; at the foot of Alaghiz in the Mount Ararat massif, however, it was apparently employed

for chipping archæolithic implements, because no flint existed in those parts.¹

In Egypt obsidian was imported either from the Islands or from Arabia, for there were no volcanic hills nearer the valley of the Nile, and we find it in the form of small vases in the Nakadah tomb. It was never used like flint in Egypt, for it was not employed for the fabrication of weapons and implements.

Thus we see that the instinct for barter was strongly developed in all lands from the times of neolithic industry, though at first the materials of exchange were few and means of communication absent. Travelling was either overland or by river in pirogues, and, whatever may be the opinion of many archæologists, the people of those times ventured little on the high seas, except for fishing. Their vessels were far too unstable to warrant the risk of long voyages along coasts that were often very inhospitable. The Mediterranean was much more inviting to navigators than the wide ocean. Thus it should not surprise us to see the first steps in navigation made on this inland sea long before the great expanse of the pathless ocean was ventured on.

With the appearance of the metals, however, the conditions of travel were swiftly modified. Sanchoniathon tells us that the first navigators of Tyre,² having cut down a great tree and stripped it of its branches, rolled it into the sea, and, mounting astride this hobby-horse, set forth to discover the unknown. The men of the polished stone phase were at all events less primitive than these legendary Phœnicians, for they hollowed out pirogues, occasionally of great size, but implements of metal permitted of more rapid and accurate work, and the building of real ships was then undertaken, whereupon a coasting trade developed all along the sea-shore. A considerable extension of trade relations resulted, whilst negotiable articles of merchandise became more numerous from day to day. In this overland and sea-borne trade metals occupied the premier place, then came rock salt, for which, as for salted provisions, there was a great demand on the Continent.

¹ J. de Morgan, "Les Stations Préhistoriques de l'Alagheuz (Arménie Russe)." *Rev. de l'Ecole d'Anthrop.*, 19th year, Vol. VI, 1909, pp. 189-203.

² According to Eusebius, *Præp. evang.*, I, X, 10.

If we mark on the map those districts where bronze ingots have been met with most often, it will be seen that in France they lie on the Ocean and Channel coasts, in the vicinity of copper mines and natural deposits of salt, or near the passes leading from Gaul into Italy. The explanation is that the transport of metals, which were brought from Cornwall, was by sea, and thus the salt was paid for in metal; further, that the pre-Gauls supplied the North of Italy, crossing over the Alps.

Scandinavia, though rich in copper, had no tin, and we are of opinion that tin was imported exclusively from the British Isles in the form of bronze ingots, for it was bronze itself that formed an article of commerce, not the separate metals of which it was the alloy.

What did Gaul receive in exchange for its products, and what did it give to the overseas metallurgists in payment for their metals? Cloth, certainly; for all primitive peoples rate it highly: and those manufactured articles that we find both in the lake-dwellings and in sepultures, such as gold ornaments, daggers and helmets from Italy, quantities of weapons from the Iberian Peninsula and Scandinavia,¹ implements and ornaments of every kind, glass beads undoubtedly of Mediterranean origin, and weapons of Hungarian pattern. Since we find this diverse merchandise on the Continent, we may reasonably suppose that it also went across the Channel and so reached the mining districts.²

The Gaulish trade in metals was not exclusively with the Western peoples. The Greek world also brought its quota by ever-nearing stages. We have proof of this in the weight of certain pigs of metal found both in France and the north of Italy. These ingots present, as a rule, the form of a two-edged axe, and their weight, which is practically constant, is that which was customary in the Hellenic Mediterranean.

These general considerations have regard only to the Western portions of Europe, and to comparatively late periods, since relations between Gaul or England and the Hellenic world can scarcely go further back than the second millennium before our era. They have no bearing on the

¹ Cf. O. Montelius, *V* (1880), 86.

² Cf. E. Chanel, "Note sur une épée en bronze trouvée à Beynort (Ain)," *Bull. arch.* (1908), 309; *LXVIII*, 237.

commerce of Western Asia or Egypt in pre-dynastic times, at a period when the Greek world had not yet emerged into the light, and the Semites of the Phœnician coast were far from dreaming of a passage through the Pillars of Hercules.

A people who had come down from the mountains had then recently occupied Chaldea, a land newly risen above the waters, and they brought with them copper, the knowledge of which they passed on to Egypt. But whence came these men? It was not from the Iranian plateau, uninhabited in Quaternary times, nor from Transcaucasia. Probably they came from the mountains of Armenia and Upper Assyria. Be that as it may, they knew how to make bronze with tin a few hundred years after they had established themselves in Elam and Mesopotamia. Egypt and Syria were with them in this new way of metallurgy. We have seen above that, according to indications, we have not yet been able to verify, there did exist in these districts natural deposits of tin, and that these mines have been abandoned for centuries. It would seem to be likely that the earliest bronze used in Chaldea and in Egypt came from these mountains, for it is impossible to believe that at this remote epoch the Orientals could have obtained this metal either from Portugal or from islands in mid-ocean. It would have been equally impossible for them to have got it from Central or Southern Asia.

Though we may claim a number of discoveries for Europe and in many cases should be justified in rejecting explanations involving Central Asiatic influence, in regard to Chaldea and Egypt we are obliged to seek in Western Asia itself an explanation of the presence of tin in the early days of the bronze industry.

Probably this traffic was not effected by caravans travelling directly from the mines to Susa and the old cities of the Tigris and the Euphrates. The precious metal was probably passed on from hand to hand, for direct barter would have involved the introduction of Chaldean influence into the mountainous regions of the North, and we have found only fugitive traces of such influence in the iron industry period, even when the metallurgists of Transcaucasia had adopted the Assyrian weights for the metal they exported.

The traffic was very active at an early period between Chaldea and the Phœnician coasts. The main route

followed the Euphrates as far up as Antioch, turning then towards the South. Another natural route along the valley of the Tigris brought the lower plain into communication with the Ararat district, which, as we have seen, was rich in obsidian. Here, extensive copper deposits were worked, where the ore outcropped, and exploited for export, since, in the Armenian iron age, ingots in the shape of rings—a form of currency of standard weight—were made on the pattern of the Assyrian mina and its subdivisions.¹

Egypt traded chiefly with the Asiatics of Phœnicia and Chaldea and with the Libyans. Her ships visited all the islands of the Eastern Mediterranean; but apparently she did not penetrate further into West Africa than the oasis of Ammon. Her trade in barter was more particularly directly towards Central Africa, whence she received gold, ivory, and also, probably, those fine minerals which she knew so well how to fashion into vases, amulets, and jewels. The Nile was her natural highway—a divinity to her merchants no less than to her priests. But, so far as we know, the Nile did not bring her the tin she needed for her bronze metallurgy, nor did Egypt, any more than Chaldea, go to seek it beyond the Ocean mists.

The Sinai peninsula, rich in turquoises but poor in copper, furnished Egypt only with a very modest proportion of metal, in spite of the many fables reported on this subject. That is why the men of the Nile later went to Cyprus for their supplies. The Sinai peninsula, none the less, was the main bulwark of Egypt, and protected Pelusium against an enemy coming out of Asia. Its reputation came thence, and not from its copper deposits, which, as we have seen, were of little or no importance in relation to the needs of the Empire of the Pharaohs.

It would not seem that Egypt was ever in direct communication with western Mediterranean lands. It was through the Cretans, Phœnicians, and Hellenes that its influence, and occasionally its products as well, gained access to Italy, Southern Gaul, and Spain.

The Ægean world lived on the water, and its trade routes were those of its ships. In the north, as we have seen, the continental Greeks had indirect relations with the northern

¹ Cf. J. de Morgan, *Mission scientifique au Caucase* (1889), I.

countries and Western Europe, but the islanders were limited as regards their trade to the Phœnician coast and Egypt. Hence they sought to traffic with new countries, and embarked on the quest of the Golden Fleece along the shores of the Euxine, the coasts of Italy, Gaul and Spain, and in the greater isles.

Undoubtedly certain Central Asian elements entered into this commercial traffic. In any case *Ægean* trade is of much more recent origin than that of the pre-dynastic Egyptians and the proto-Chaldeans. The foregoing considerations are singularly strengthened by the fact that, from the earliest times of which history or tradition tell us anything, we hear of a regular flood of barbarian peoples who, coming out of Central Asia invaded not only Europe but South-western Asia itself. They all followed the same direction—the course of the sun. Why should we suppose that this great stream only began to flow at the moment when history begins? Why not admit that these peoples maintained some connection with their land of origin and continued to trade with it, importing from the Siberian plains, or possibly from even more distant regions, such articles of merchandise as they lacked in their new home, and that they distributed these articles in Europe as well as in Western Asia and Egypt? Not so long ago every invention and all commercial relations were attributed to these foreigners. To-day we deny them everything and even seek their cradle in one of our western lands, though the concatenation of fact shows that they came out of the very distant East, by successive waves, and that even to-day many of these hordes are ready to recommence this migration towards the setting sun.

It is necessary to consider these far-eastern influences very carefully ; it is true that we cannot yet appreciate them at their full value because the study of Central Asia has yet to be undertaken. But let us not seek to attribute everything to our own land just because documentation is wanting for other regions. By doing so we lay ourselves open to serious error. Is it not better to confess that sufficient evidence is not yet at our disposal to warrant us in attacking these problems, and that we are as yet unable to do more than put forward certain hypotheses?

SOME INFERENTIAL CONCLUSIONS.

IF we indicate on a map the data supplied by prehistoric archæology relative to glacial times, and if we fill in this outline with the information furnished by geology as to the extent of the Quaternary ice, we find ourselves face to face with the most unexpected revelations. Unfortunately the disclosures made by the study of such ground as is now accessible are incomplete, for we know nothing of the lost continents, and only very little about the modifications undergone by the coastlines of the land we now inhabit. Be that as it may, such information as we have about those portions of the earth's crust which are emergent to-day is sure. And even if considerable uncertainty still reigns in regard to the migrations of the earliest human colonies and the influence exercised by one primitive tribe on another, we yet have sufficient data at our disposal to outline the first steps in human progress. I must observe, to begin with, that, in all their works, prehistorians take as types of the various industries the forms found in Western Europe, and that for the most part they make Western Europe the centre of diffusion. This entirely unscientific procedure is due to the fact that Western Europe is more fully explored than the other parts of the world. We are still obliged to give to Europe an importance disproportionate to the part it has played; but the day will come when it will be assigned its exact provincial value, and the terms and nomenclature employed to-day will then lose the illusory importance with which we now credit them.

We have seen that palæolithic industries—the earliest of which we have certain knowledge—may be divided into three sub-industries; Chellean, Acheulean, and Moustierian; that apparently these three forms of stone-working are contemporaneous and dictated to Man by local needs. Chellean and Acheulean implements, moreover, are found in many parts of the world far removed one from another, and certain of these districts apparently had no contact with other districts of the same industry (Fig. 186). We are led to

conclude, therefore, from the wide geographical distribution of these types, that the same causes have produced the same effects at various times in different regions, and that palæolithic industry originated not only in North America but in India, in Australia—where it is still extant—in southern Africa, Western Europe, and perhaps in many other places besides. We note on the other hand that the “coup de poing” is absent in a great many regions such as Siberia, Eastern and Central Asia, Greece and its islands, Asia

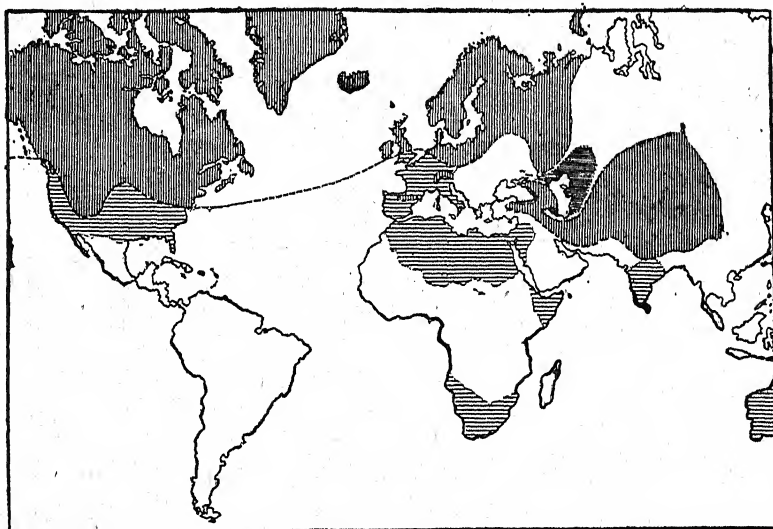


FIG. 186. Glaciation, and the distribution of palæolithic industry (Chellean and Acheulean types).

Minor, South America, Mexico, certain parts of Central Africa, North Africa, and in the Iranian and Armenian plateaux—districts that were covered with ice during the greater part of the Quaternary period and were consequently uninhabitable.

Western Europe was then separated from the Eastern world by a veritable natural obstacle. In Russia the polar glaciers descended as far south as the Ural, and the area separating them from the Irano-Caucasian glaciers was occupied by the Aralo-Caspian Lake whose waters covered the Turkomans of our era, and of which the Caspian and the Sea of Aral are but the last traces and the deepest

depressions. But if communication was cut off between Central Asia and Europe, it was otherwise in regard to the Mediterranean. There the way was open, easier to follow even than it is to-day, for there were certainly land bridges connecting our continent with the African coast at that time. The Balearic Isles, Corsica, Sardinia, Sicily, and Malta are nothing but the remnants of those great causeways by which the animals of the north retreated before the constantly increasing rigours of the European climate, and which, perhaps, permitted Man to spread abroad his first industrial discoveries. In those days it would have been possible to pass from the valley of the Rhône to Africa in a few short weeks, either via Italy, or through Spain as the Germanic invaders did later, or by crossing over land that has to-day disappeared.

The diffusion of palæolithic industries throughout the Mediterranean basin is thus readily explained by the facilities for communication. Moreover, the diffusion of Moustierian forms of implements, which were peculiar to the Old World, supports this hypothesis (map, Fig. 187), for the habitat of those forms apparently centred around the Mediterranean Sea. Nevertheless, the deduction we have just drawn does not permit us to form any opinion regarding those more distant regions where palæolithic instruments are found. Was there still, at that epoch, a continent joining Somaliland to the Indian peninsula? It is possible; but on the other hand, the Somalis were separated from the pre-Egyptians by great spaces and high mountains which were unfavourable to intercommunication between peoples. And perhaps North America was linked to Europe by an "Atlantis," a continent of which Terra Nova and Iceland would be to-day but the highest points remaining above water, and then covered with ice. This assumption of communication via an "Atlantis" would seem to have very little foundation, although it is based on the geographical distribution of the seas in late Tertiary times.

However that may be, if a single centre of palæolithic culture ever existed—perhaps in a land which has to-day disappeared—the propagation of these industries was not the matter of a day, hence synchronism for the same industry in all regions cannot in any case be admitted.

What then are we to think about those lands in which palæolithic implements are not found, though these lands had emerged from the water and were not covered with ice? Were they uninhabited, or were the men who dwelt in them still at the stage of *homo stupidus*? Greece, Macedonia, and Asia Minor, to speak only of countries of the Old World,

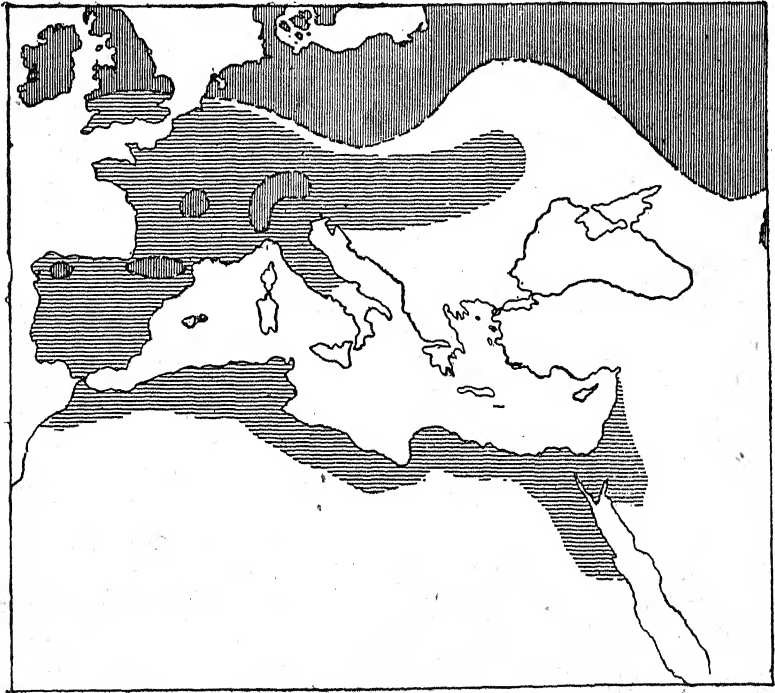


FIG. 187. Distribution of Moustierian type.

had no knowledge of the "coup de poing." And yet these countries are not far removed from Syria, Egypt, or the Italian peninsula, where we have discovered some traces of palæolithic industry. In these regions, as in the islands of Cyprus, Crete, and the Archipelago, the first colonists were Neolithics, and often even Eneolithics. They polished stone and made use of copper; they must, therefore, have been foreigners, who had necessarily advanced to this degree of culture in other lands.

Whether this great first industrial expansion had its origin in distribution from one main centre or from many, it came to an end, none the less, with the palæolithic phase. Regionalism became established after the post-Moustierian depopulation, and we should seek in vain and, moreover, we have sought in vain, for a generalization of archæolithic types. From that time forth each region had its own habits and customs

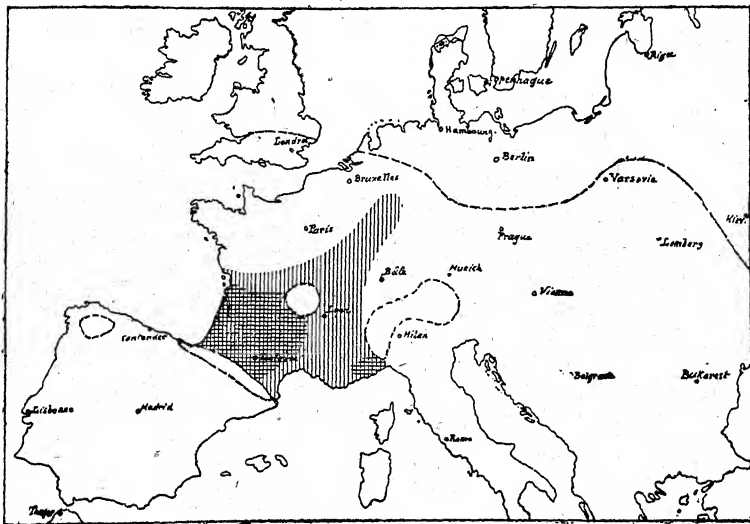


FIG. 188. Distribution of the Aurignacian industry.

adapted to its needs and local resources. The Aurignacian (map, Fig. 188) is scarcely seen outside France; the Solutrean (map, Fig. 189) extends a little into the north-west of Spain and Switzerland, and certain analogies have led us to believe that it extended as far as Moravia and Russian Poland, but this is still very doubtful. Magdalenian industry was of greater extent (map, Fig. 190); it covered the north-west of Spain, the south of England, all Gaul, and a part of Central Europe, extending as far as the Ukraine. It is permissible, nevertheless, to be sceptical in regard to the homogeneity of the industries thus grouped, for similarities in a few flint implements do not, of necessity, imply an identity of culture. The polished axe, the single or double scraper, the awl, and the trimmed blades of the Egyptian

Neolithic recur in Spain, France, Algeria and many other countries, but we cannot attribute an identical origin to the men responsible for the civilization of these different countries. A complete set of facts bearing on all their manifold applications would be necessary before we should be justified in identifying two cultures.

The close of the Quaternary period saw the breaking

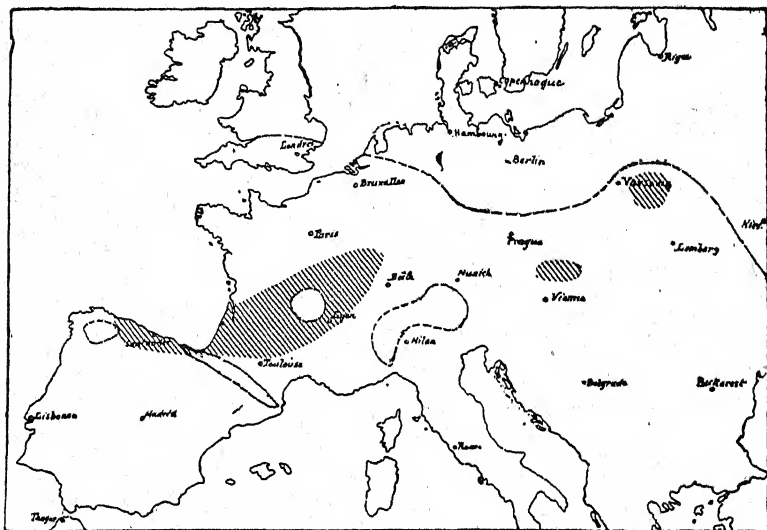


FIG. 189. Distribution of Solutrean industry

down of the barriers that had hitherto shut off different portions of the Old World. The glaciers gradually retreated to become limited to Polar regions and the summits of high mountains. Lakes fed by the snows dried up, and the gates of Northern Asia were thrown wide open. It was a great reservoir of men which was to empty itself, if we may judge by post-Quaternary events, in successive floods throughout thousands of years into our part of the world, where the appearance of mesolithic industry would seem to have been its earliest consequence.

With the arrival of these new-comers we see cattle-raising and agriculture appear, and cereals are henceforth cultivated, but it is impossible to say whether these advances in culture were achieved by an autochthonous

race, or were brought in from distant lands by invaders. Very little later, stone was polished in Gaul, in Central Europe, and in Scandinavia, and the potter's art developed. But the newly-arrived peoples, though they were probably more highly developed industrially than the aborigines, were but barbarians in matters of art and taste. The eclipse of the fine Magdalenian school of sculpture and drawing

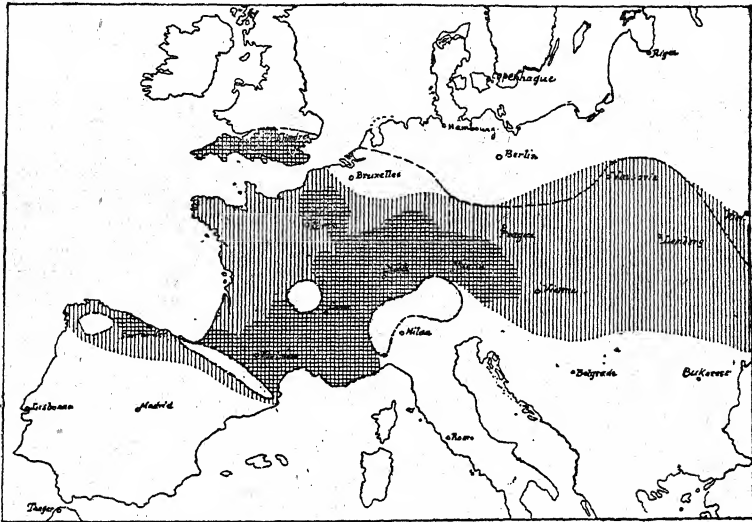


FIG. 190. Distribution of Magdalenian industry.

coincides with their arrival. The cavern representations are generally considered to have had a mystical significance—a totemic value—and therein probably lies both the reason for their abandonment and the appearance of new conceptions supplanting the old beliefs.

This epoch, which supplies the basis for our first substantial ideas in regard to the migrations of peoples, also raises a problem of the highest importance. We have seen that wide spaces on the map were left empty by palæolithic industry, and we know that European archæolithic types of implements occupied but a small portion of the ancient continent. What happened in those blank areas? Certain countries such as Greece, Asia Minor and the Islands were settled by colonists, and their earliest industries were those

of polished stone—often accompanied by metal as was the case in Chaldea and Elam.

In other areas, such as Tunis and Algeria, a very few highly specialized and differentiated flaked stone industries followed the palæolithic phase, thus corresponding to the Aurignacian, Solutrean, and Magdalenian in our part of the world. Thus the Capsian, particularly characteristic at El Mekta (Tunis), was the transitional stage between the Acheuleo-Moustierian and the neolithic types, and was possibly accompanied by metal.

The transition is even more abrupt in the valley of the Nile. Acheuleo-Moustierian implements which are numerous in the desert alluvium, but have never yet been found *in situ*, are immediately followed, with no intervening transition, by the most perfect examples of neolithic type. It is always possible that examples of the intermediate industry are yet to seek, but this is extremely doubtful, for the zone still to be explored is limited, and no trace of an archæolithic phase has hitherto been discovered. In the caverns of Syria remains have been found that at first sight seem to belong to archæolithic culture, but their age and nature are still under discussion.

From these observations, bearing on a number of different areas, it is seen that certain districts were still unoccupied when the first post-Quaternary colonists arrived, that others were still in the palæolithic stage, and that in certain districts archæolithic forms were in use; further, that the various "ages" of Western Europe have merely a local value, whose importance has been exaggerated by many archæologists. They have been led to assign to these industries a preponderant rôle simply because they themselves were absorbed in daily study of them.

It must not be forgotten that in glacial times mid-European countries were exposed to a considerable lowering of the temperature, whereas these climatic conditions were not present in more southerly districts. The graffiti discovered on the rocks of Upper Egypt show rude representations of the Giraffe and Elephant, and the painted funerary vases depict herds of Gazelles and Antelopes, and troops of Ostriches. In North Africa, which had not then dried up to the present degree, there was a hot, damp climate, hence

the conditions of existence were very different from those contemporaneous with them in our part of the world, and these differences in the life of its inhabitants are reflected in the weapons and utensils Man made to meet his needs.

So long as the dam remained that in glacial times closed the route from Central Asia to both Europe and the fertile land of the Tigris and Euphrates, and so long as the Persian plateau and the Caucasus were covered with snow, and the Aralo-Caspian Lake extended to the very edge of the polar glaciers, so long did civilization evolve independently in each district, advancing slowly but without interruption. It is probable that it was into this relatively homogeneous environment that foreigners came, bringing with them new knowledge, when the gates of Central Asia were opened. Undoubtedly this barrier, corresponding with the maximum extension of glacial invasion, may have been broken several times during the course of the Pleistocene when the snows retreated, and thus the Central Asian peoples may have overflowed more than once into the Mediterranean West, and into Central Europe. Possibly the primitive arts and industries of Chaldea and Elam, whose origin is still unknown, may be traced to such migrations. Perhaps they came from the north of Western Asia, from the land of the mountain goat and the sheep. It is at all events possible that certain practices spread from the banks of the Tigris, the Euphrates and the Kerkha to Syria, Palestine, the valley of the Nile, and later, through the intermediation of the islands, to the Mediterranean West. This first emigration of Central Asiatics, or, at all events of their ideas, must have been by far the earliest great human movement. It would have found Man still using palæolithic weapons and implements in Chaldea and Egypt, and the Hellenic peninsular and the islands devoid of inhabitants; later on it would have found on the coasts of Northern Africa an indigenous population that had replaced the palæolithic industries by others, such as the Capsian, more suitable to their needs.

These currents which flowed from Central Asia would necessarily have been divided into two separate streams by the obstacle presented by the Caspian and the Caucasus. The northerly route, winding through marshes left by the

retreat of the glaciers, was longer and more difficult than the southerly, and many centuries certainly went by ere the migrants, or at any rate their culture, actually reached our Western European area. For thousands of years the East continued to pour forth these human waves in the direction of Western Europe and Western Asia, each creative or destructive wave invariably modifying the existing conditions.

These successive floods flowing slowly westwards each brought with them different ideas. In the land of their origin some populations would be more advanced than others, though even these relatively advanced peoples may actually have been backward. If we limit our consideration to the human waves that came from the East in historic times, we still realize their wide divergences in aptitude and taste. It was not otherwise with the earlier invasions, as the traces they have left us prove.

Such inferences, though justified in the light of present knowledge, are merely hypothetical, and as such must not be strained too greatly. To-morrow, maybe, they will crumble to nothing in the presence of new discoveries. However, we may take it as certain that the discovery of metal was made neither in Chaldea nor in Elam, because these countries were not inhabited prior to their occupation by eneolithic colonists; nor, for the same reason, in Egypt, and because copper ores were there too scarce; nor in the Mediterranean Islands of the East. The discovery was made in the northern mountains of Western Asia, as the finger of tradition has pointed out to us.

In the last two thousand years before our era the complication of prior influences was accentuated, for to the direct and ever more nearly approaching influences from Central Asia were added those of the civilizations of the Eastern Mediterranean, and these cultures reacted on one another and were linked together by a number of conceptions common to them all, though they retained their individuality. This influence on barbaric peoples, whose aptitudes were extremely diverse, was still further complicated by the influence such populations had upon each other. Relations between different populations, which are most difficult to reconstruct, usually developed from a gradual approach,

thus producing hybrid ideas which were sometimes very far removed from the parent conception.

We are ignorant of the cause of these Siberian migrations. Maybe we should attribute it to the increasing cold in that country and Central Asia, but we are too ill documented to say for certain, since Central Asia and Siberia are still almost unexplored from the archæological point of view. The sole traces of Magdalenian industry in Western Asia, excluding Syria, are those yielded by my investigations of obsidian stations at Alaghiz (Transcaucasia). These, however, are extremely doubtful. Perhaps the forests and valleys of the Altai, almost uninhabited to-day, may hold great surprises for us with regard to the variety of causes which prompted the departure of the Siberian populations. It is possible, indeed, that the enormous increase in the Chinese population caused the westerly migration of the last Mongolian and Turkish hordes.

Yet these peoples, come from afar, if they brought with them new customs and valuable industries, nevertheless failed to reap from their knowledge all the advantages possible. For the most part, they remained barbarians in the face of the great civilizations of Egypt and Chaldea. They did not all lack aptitude and individual genius, however, for from their stock were to spring Hellenes and Latins, whose ancestral ideas were complemented to such a point by what they learned from Asiatic and African culture that eventually they surpassed their teachers in every branch of human knowledge.

Each people settled in Europe bore its share in general progress, but not all were equally apt at learning, nor in assimilating fruitfully higher ideas. Thus it was that Græco-Latin culture, which to-day dominates the world, was not comprehended in every land, in the same degree, and that even in this twentieth century, many peoples still retain the barbarian instincts of their ancestors, although they may appear to be of advanced culture.

The theoretical method which consists in creating a "chronological period" for each new custom, and synchronizing the event in different countries, has for long been highly prejudicial to prehistoric study, for to-day we have proof that these customs arose at very different times in

different localities. Even as history does not begin at the same period of time for all peoples, so we should delete from the archæological vocabulary the words *age*, *epoch* and *period*. We should recognize in the evolution of humanity a succession of local and individual advances and retreats, discoveries and forgettings, making up a whole, the result of which, though sometimes slow and sometimes rapid, is a steady advance by humanity towards an ideal. But we must study each element of this advance by itself, while taking due account of external influences, for it is often possible to get a chronological notion of the data under investigation by comparing these with the culture of peoples who have already passed into history. Among these influences there are some that emanate from centres forgotten to-day. We little knew, forty years ago, what an important part Crete had played in Mediterranean culture! Can we be sure that no other revelation of a forgotten civilization will arise to disturb our hypotheses?

Many a people who in their day played a great part disappeared into oblivion as the result of some misfortune. Urartu was a powerful kingdom that fought, often with success, against the kings of Assur; it would be quite unknown to us but for the inscriptions cut by its princes on the rocks at Van. We scarcely remembered Elam, before the labours of the Delegation in Persia. We know nothing of the powerful sovereigns who constructed the ruined cities of Yucatan. From these few examples taken from history, we can gain some idea of the causes of uncertainty relating to prehistoric facts, for prehistory is no less fertile in great events than history—events that are even further removed from us than those of which the annals of history tell us, so that we are frequently led by our ignorance to synchronize facts that are analogous but nevertheless of very different date and origin. We talk of the “epoch of the dolmens,” as though the dolmens had all been constructed at the same epoch in all parts of the world. Let us be on our guard against such generalizations and content ourselves with studying in each district bounded by natural frontiers the succession of manners and customs, industries and ideas that took place before destiny brought its population within the ken of history, and then if certain regions have to be

grouped together facts will compel such association as they already have done for certain artistic groupings.

For thousands of years all peoples were without annals ; then the dawn of history appeared with the discovery of writing. Chaldea, Elam, and Egypt early realized this vision, whilst many other peoples have left essays that had no to-morrow. Then Crete, Phœnicia, Assyria, the Hittites, Cyprus, and finally the Greeks and Latins appear on the scene. The barbarian nations registered their high deeds at a comparatively late date. The history of Gaul begins only with Cæsar in the first century before our era, and Scandinavian history begins under the Carlovingsians ; the annals of the Slavonic peoples are less ancient still ; and the uncivilized tribes of the New World, of Oceania, Central Africa, Laos, and of the Malaysian Islands are without any history at all. Each nation, each tribe even, provides the prehistorian with a heavy task. Ethnography long precedes history, then comes into contact with it, to be eventually but gradually merged in it.

We have shown, at the beginning of this volume, how risky it is to launch into chronological estimates whether in regard to the geological history of the earth or to the events of human prehistory. Thanks to certain data that are less inexact and to historical documents, we are enabled, however, to outline a few dates relative to the latest periods of human progress which belong rather to proto-history than to prehistory. For events prior to these we can indicate their succession only, as in geology.

In our part of the world the glacial period followed the elevations of portions of the terrestrial crust that marked the close of the Tertiary epoch, and led to the formation of immense snow-fields. Those first traces of human intelligence evidenced in palæolithic industry appeared towards the close of this geological phase. Then, as a result of climatic change, cataclysms, and fresh needs, archæolithic industry follows in its three successive forms : Aurignacian, Solutrean, and Magdalenian. After the retreat of the glaciers, new men, or at least new ideas, penetrate into our part of the world, and spread not only over the districts inhabited at that time, but also over those regions which had but recently been abandoned by the snows. It

was then that mesolithic industries appeared—those of the kitchen middens and Campigny—and the knowledge of pottery accompanies them. Then comes polished stone, cattle-raising, agriculture, and weaving ; and, in the course of neolithic industry, copper, the precursor of bronze, whose coming is placed in the third millennium before our era by those archæologists most worthy of confidence. The beginning of the first millennium before Christ must have seen the use of iron distributed throughout our regions, and the whole of Central Europe must have followed very nearly the same phases of progress under other forms, and more or less during the same period.

The northern countries—Scandinavia and Finland—covered with ice during the entire Quaternary period, remained uninhabitable, and the earliest traces of Man found there belong to the phase of mesolithic industry. Then, as in France, though much later, we discover polished stone, copper, bronze, and finally iron.

In the Mediterranean—in Crete and Cyprus—the first inhabitants were Eneolithic. They introduced the knowledge of copper during the fourth millennium before our era ; then bronze, a thousand years later, and finally iron, during the same epoch as in the West, although certainly a few centuries earlier. The same is true for continental Greece, Asia Minor, and Thessaly. The dates generally proposed for the Eastern Mediterranean region do not seem, however, to be sufficiently remote, if we accept those which we have put forward above in relation to the West ; for the Eastern Mediterranean communities were in communication with the oldest civilizations of the world, and consequently could not have long remained ignorant of the processes in vogue in Chaldea and Egypt.

It would appear that the Egyptian valley of the Nile, in its upper part at least, was early occupied by African tribes with crimped hair, and perhaps also by some Libyan groups, who had come from the African shores of the Mediterranean. These men succeeded, probably after a long interval, the palæolithic population. They were in the polished stone stage when copper made its appearance among them, brought in by straight-haired Asiatic peoples who probably already occupied the river delta.

The phrase of eneolithic industry was of long duration in Egypt. It included what the pharaonic people called the period of the "servants of Horus," and the reign of the first dynasty princes. It was only later, probably in the course of the second dynasty, that bronze made with tin appeared. We cannot be sure when iron was introduced, as the scanty information we possess about it is not conclusive, though it would appear to have been known as early as the Thinite times. Its current industrial use apparently dates only from the end of the second millennium before our era.

Thus even if we follow the Germans and bring forward the entire Egyptian chronology by a thousand years, which puts the era of King Menes at about 3300, the early days of pre-pharaonic civilization must still be placed more than 6000 years before our time, and for Chaldea and Elam the dates would be somewhat earlier still, since it was from Asia that Egypt derived her progress.

We shall speak neither of India nor of China, whose local legends exaggerate their antiquity at will. Their civilizations are not so ancient as is generally supposed. That of China dates from seven or eight centuries before our era, but its prehistory is still absolutely unknown. It is remarkable that up to date not a single Chellean implement has been made known in the Far East.

In India the data furnished by archæology remain vague. The "coup de poing" is met with in the southern and central parts of the peninsula, but a long hiatus then follows. We see dolmens in the north, and polished stone is in evidence in nearly every province; but we do not know whether metal accompanied it. At all events the copper industry flourished in the peninsula during a long time. Indian history begins very late, only, in fact, a few centuries before our era, with the conclusion of the campaign of Alexander the Great.

In the New World certain regions enjoyed prosperity. In Mexico and Peru, among others, vases were turned, metal engraved and cast, and the annals of various kingdoms were inscribed on monuments and skins. Unfortunately, however, the religious fanaticism of the Spanish monks destroyed all those perishable documents that might have

informed us as regards the evolution of these peoples, and perhaps have told us their history. Since every positive chronological guide is lacking for these regions, we are reduced to conjecture.

We have seen that nothing is known about the peopling of the islands of the Mediterranean East before their colonization by men in the eneolithic stage of industry. The earliest archæological evidence in our possession relating to these colonists leads us to believe that they migrated from continental Asia and not, as I myself thought, from Europe, and also that this migration took place in the course of the fourth millennium before our era. Then the Pelasgians appeared on the scene, bringing with them into this environment new conceptions foreign to Asia. While they occupied the Hellenic peninsula in Europe these tribes must also have advanced as far as the Asiatic islands and mainland amongst other highly evolved populations, which in no case can be confounded with the Pelasgic tribes. There was further the progressive invasion by a new element known as the *Ægean*. Two physical types were in evidence from somewhere about the second millennium before our era: the one dolichocephalic—the earlier of the two—which had already furnished the Minoan civilization; the other and more recent, brachycephalic, which must have been the author of Mycenæan culture, and was related to the tribes that in those times inhabited Thrace and the banks of the Danube. These colonists were not, properly speaking, Hellenes, but Thraco-Phrygians, closely related to the Greeks. From this stock came the Armenians, who, after having crossed the Bosphorus, probably proceeded from the west eastwards in a direction contrary to that taken by all other invasions, and who, towards the sixth century B.C., settled on the plateau of Erzerum and in the Ararat district.

It was altogether otherwise in Central and Western Europe. One of the human waves from Asia that flowed across the Russian plains carried with it right up to the shores of the Atlantic the use of polished stone and that of copper and bronze. This particular wave is generally identified with those Ligurian tribes, which, during many centuries, peopled Gaul. Next came the Celts, with their

Hallstatt culture and iron industry—people who left traces of their passing in the valley of the Danube, in the Ukraine, in the Central Caucasus (Osethia), Transcaucasia, and in those Persian districts of the West that lie near the Caspian—but the cradle of whose race, though still unknown, is probably much farther towards the east.

Ligures and Celts brought with them not only specialized industrial knowledge, new to the European West, but also artistic tastes that differed greatly. The first limited their artistic conceptions to geometrical decoration; the second introduced into their work representations of men and animals, but shared the same methods of using the geometrical designs as the Ligures, who had used them before the Celts came. Neither of these two groups, though both had skirted the great Asiatic Empires, would seem to have been influenced by contact with their civilization. Their taste remained highly individual right up to the time of their establishment in Europe, and it was only after their arrival that their art showed signs of having borrowed from Mediterranean civilization. In the industry that succeeded the Hallstattian, known as the "La Tène," abundant traces of Mycenæan, Greek, and Etruscan influences are visible. But here we enter the historic period of the western districts of Europe.

Such, in a few lines, was the successive order of the main facts relating to human prehistory in the Old World. It is simple in general outline, because the real advance was derived from two great centres, the more recent of which was situated in the north of Asia, and the more ancient in the southern portion of Western Asia and in Egypt. This outline, however, is extremely complicated in its details, whether we envisage the numberless clans of primitive humanity, or examine the diverse branches of advancement. The double origin of our civilization is an established fact indicated by tradition and confirmed by archaeological discoveries. But the great problem remains of the discovery of metal and of what happened in Central Asia before the arrival in the European world of the Aryan-speaking peoples. Diverse problems become confounded one with another, and we shall only arrive at their solution when Siberia and Central Asia, to-day uncivilized, are administered by peoples

interested in the sciences, and when, having been made to yield up the secrets of their soil, these are studied with the same method and perseverance as are our territories in the West.

Even then the prehistorian's task will be far from accomplished. For though light is gradually dawning on European and Mediterranean origins, four-fifths of those continents whose populations individually have played a more or less important part in the general concert of progress remain to be studied. What we know to-day is very little in comparison with what remains to be learned.

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